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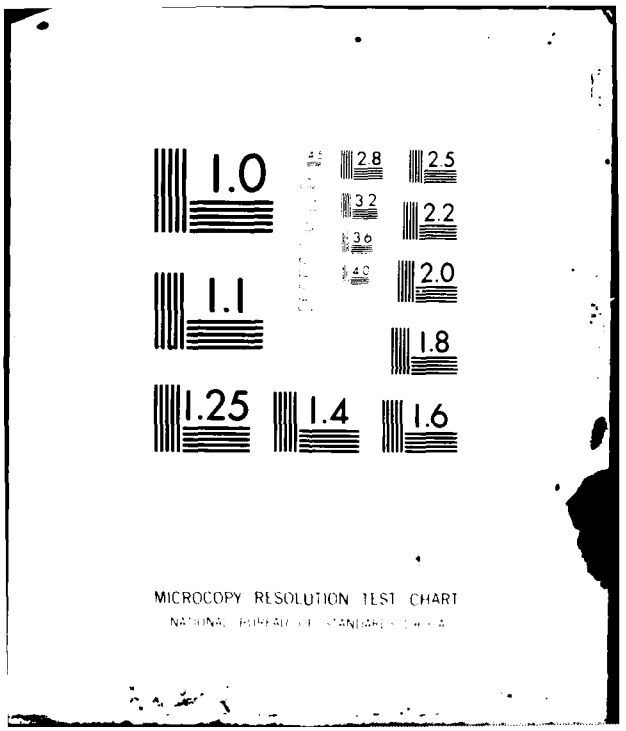
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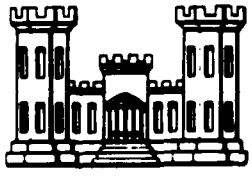
LEVEL II

LONG ISLAND BASIN

WHITE PLAINS RESERVOIR DAM NO. 2

WESTCHESTER COUNTY, NEW YORK
INVENTORY NO. N.Y. 24

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



NEW YORK DISTRICT CORPS OF ENGINEERS

JULY 1981

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18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
White Plains Reservoir No. 2 Dam
Westchester County
Long Island Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and a visual inspection of the dam and the appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Using Corps of Engineers' screening criteria, it has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of Probable Maximum Flood (PMF) with all stoplogs removed. The spillway is, therefore, adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

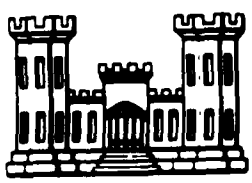
The classification of "unsafe" applied to a dam because of a "seriously inadequate spillway" is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

LONG ISLAND BASIN

WHITE PLAINS RESERVOIR DAM NO. 2

WESTCHESTER COUNTY, NEW YORK
INVENTORY NO. N.Y. 24

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



NEW YORK DISTRICT CORPS OF ENGINEERS

JULY 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D. C., 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
WHITE PLAINS RESERVOIR NO.2 DAM
I.D. NO. N.Y. 24
D.E.C. NO. 274
LONG ISLAND BASIN
WESTCHESTER COUNTY, NEW YORK

CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM:	White Plains Reservoir No. 2, NY 24
STATE LOCATED:	New York
COUNTY LOCATED:	Westchester
STREAM:	Tributary of Bronx River
BASIN:	Long Island
DATE OF INSPECTION:	April 2, 1981

ASSESSMENT

Examination of available documents and a visual inspection of the dam and the appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property.

Using Corps of Engineers' screening criteria, it has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of Probable Maximum Flood (PMF) with all stoplogs removed. The spillway is, therefore, adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate spillway" is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

It is, therefore, recommended that within 3 months of notification to the owner, detailed hydrological-hydraulic investigations of the structure should be undertaken to more accurately determine the site specific characteristics of the watershed and their affect upon the overtopping potential of the dam. At the same time a dam break analysis should be carried out to ascertain the effect of a sudden flood from the upstream reservoir discharging into the lower reservoir. The results of these investigations will determine the appropriate remedial measures which will be required to achieve a spillway capacity

adequate to discharge the outflow from at least the ½ PMF. In the interim, the flashboards should be removed to lower the reservoir about 2 feet and a detailed emergency action plan must be developed and implemented during periods of unusually heavy precipitation. Also, around-the-clock surveillance of the structure must be provided during these periods.

The following remedial measures must be completed within 1 year:

1. The active erosion along the crest of the dam and the upstream face should be stopped and the existing damage repaired.

2. Small trees, large dead trees and all trees near the crest should be removed from the downstream slope of the embankment. All depressions created or existing from previous tree removal should be backfilled.

3. The valves in the upstream intake house should be repaired.

4. The concrete on the spillway training walls should be repaired and debris from the channel removed.

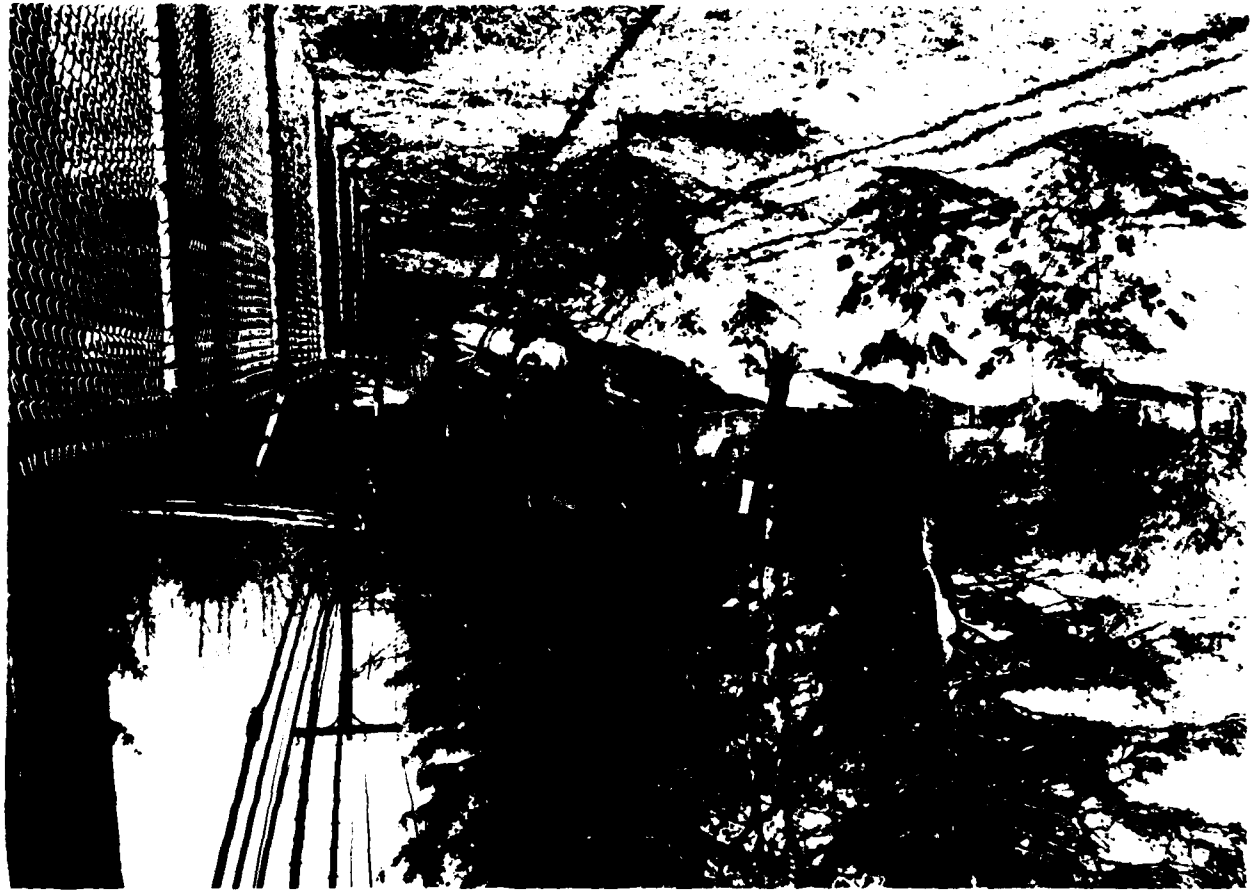
5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of moving parts in the reservoir outlet system. This program should be documented for future reference. The emergency action plan, described in Section 7.1d, should be developed and updated periodically during the life of the structure.

Eugene O'Brien, P.E.
New York No. 29823

Approved By:

Col. W. M. Smith, Jr.
New York District Engineer

Date: 05 JUL 1991



PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
WHITE PLAINS RESERVOIR NO.2 DAM
I.D. NO. N.Y. 24
D.E.C. NO. 274
LONG ISLAND BASIN
WESTCHESTER COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers by Contract No. DACW 51-81-C-0008 dated 14 December 1980, in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, 8 August 1972.

b. Purpose of Inspection

The inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life or property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Description of Dam and Appurtenant Structures

The White Plains Reservoir No.2 Dam is composed of a 465 ft long earth embankment with a maximum height of 35 feet and a 10 foot crest width. The compacted earthfill embankment has a central masonry, rubble core-wall which is tied to the rock foundation. The upstream face is protected by riprap. The upstream and downstream slopes of the dam are both 1V on 2H. A local highway is located on a berm about half way down the downstream face in the central and right abutment areas of the dam.

The spillway which is located at the right abutment contact is a stone masonry broad crested weir about 13 feet wide. The crest elevation of the spillway is about 4 feet below the crest of the dam. The spillway is provided with slots for flashboards and the normal operating condition is when two feet of flashboards are in place. The spillway tailrace feeds a stone masonry channel about 3 feet wide and 4 feet deep which passes along the right flank of the dam and under the roadway.

The dam which provides a water supply reservoir for the city of White Plains is equipped with a 12 inch diameter

water supply outlet pipe controlled from a gate house near the center of the dam and also by a valve downstream of the dam.

About 100 yards upstream of the end of the reservoir impounded by dam number 2 is a stone masonry dam about 25 feet high which impounds White Plains Reservoir No.1. An uncontrolled overflow spillway on this dam discharges through a stone masonry channel directly into Reservoir No.2.

b. Location

White Plains Reservoir No.2 Dam is located on Orchard Street in the northeast corner of the City of White Plains.

c. Size Classification

The dam is 35 feet high and has a reservoir at this height with a storage capacity of 192 acre-feet and, therefore, is classified as a Small Dam.

d. Hazard Classification

The dam is in the "high" hazard potential category because it is located within the city of White Plains upstream and in close proximity of a densely populated area.

e. Ownership

The White Plains Reservoir No.2 Dam is owned by the City of White Plains. The person to contact at the City is Mr. Leo Amdeo, Superintendent of Works, City of White Plains, Orchard Street Pumping Station, Orchard Street, White Plains, New York 10601. Tel.No.:(914)682-4220.

f. Purpose of Dam

The dam was constructed as the lower of two water supply reservoirs for the City of White Plains and still serves this purpose. No other uses of the reservoir or dam are permitted.

g. Design and Construction History

There are copies of design drawings in the records of the owner. Because of the condition of the documents, they could not be reproduced for this report. There is no construction data for the dam which was built in 1907.

h. Normal Operating Procedure

Water is almost continuously released through the 12 inch water supply pipe. The water level in the reservoir is maintained at a level about 2 feet below the crest of the dam

(1 foot below flashboards) by flow over the spillway and a blow off valve located downstream of the dam.

1.3 PERTINENT DATA

a. Drainage Area (sq. miles)	0.66
b. Discharge at Dam Site (cfs)	
Ungated Spillway at Maximum Pool without Stoplogs	340
Capacity of Low Level Outlet	insignificant
Total Discharge, Maximum Pool without Stoplogs (El 246)	340
c. Elevation (feet above MSL USGS Datum)	
Top of Dam	246
Maximum Design Pool	244
Spillway Crest	242
Invert Low Level Outlets	unknown
d. Reservoir	
Length of Maximum Pool (miles)	0.3
Length of Shoreline at Spillway Crest (miles)	0.8
Surface Area (acres)	29.6 ±
e. Storage (acre-feet)	
Reservoir at Spillway Crest	77
Reservoir with 2 feet of Flashboards in place	113
Reservoir at Maximum Pool	192
f. Dam	
Type	Earthfill with masonry rubble core-wall
Maximum Height (feet)	35
Length (feet)	550
Upstream Slope	1V:2H
Downstream Slope	1V:2H
Crest Elevation (feet)	246
Crest Width (feet)	10
Cutoff Type	Masonry rubble wall
Grout Curtain	None

g. Spillway

Type	Concrete overflow sill with paved upstream and downstream channels and masonry training walls
Length (feet)	13
Crest Elevation (feet)	242
Upstream Channel	Concrete slabs at elev.241, between vertical walls.
Downstream Channel	Sloping concrete slab between vertical walls

h. Reservoir Drain and Pipeline

A control structure, located approximately at the center of the dam, houses the upstream control valves for the 12 inch water supply pipe under the dam. The pipe is also equipped with a blow off valve ¼ mile downstream of the dam at the Orchard Street Pumping Station.

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

The records of the owner contain no data on site geology. However, there is data available in the published literature on the general geology of the area. The White Plains Reservoir No.2 Dam is located in the Manhattan Prong of the New England Upland physiographic province. This area is characterized by complex mountains and hills of igneous and highly metamorphosed rock. The rock underlying the site of the dam is the Yonkers Granitic Gneiss.

2.2 SUBSURFACE INVESTIGATIONS

There is no record of subsurface investigation for the dam. The shallow surface soil in the area are of glacial origin and for the most part consist of complex sands,silts and gravels.

2.3 DAM AND APPURTENANT STRUCTURES

The files of the owner contain prints which show the typical sections and plans of the dam and appurtenant structures. There are no drawings of the outlet works or any subsequent changes which may have been made.

2.4 CONSTRUCTION RECORDS

No information has been located in relation to the construction of the dam, spillway or outlet works. The completion of the project was reportedly in 1907.

2.5 OPERATION RECORD

The dam is operated for water supply by the City of White Plains. Records of use are kept by the public works department but there are no records of flow through the spillway channel. The dam is maintained by the City Department of Public Works. No systematic monitoring of the performance of the dam is in effect.

2.6 EVALUATION OF DATA

The data available in the records of the owner, along with a field inspection and personal interviews are sufficient to support a Phase I evaluation of the dam.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The visual inspection of White Plains Reservoir No.2 Dam was made on April 2, 1981. The weather was fair and the temperature was 60°F to 65°F. The reservoir was at a level 12 to 18 inches below crest level near the top of the flashboards in place in the spillway channel.

b. Main Dam

The dam, which was completed in 1907, shows signs of distress over the entire length of the crest. Wave action on the upper areas of the embankment where there is no riprap protection has resulted in extensive erosion of the upstream slope and the crest of the dam. The erosion is so extensive that the crest with an original width of 10 feet has been eroded at spots to a width of 4 feet. This erosion is an active process and if allowed to continue could lead to breaching of the dam (See Photographs 2, 3, and 12).

Additionally the following adverse conditions were noted:

1. There are a great number of very large trees growing on the downstream slope of the dam. Near the crest of the dam the roots are likely to extend to the upstream face of the dam. This could result in the formation of seepage paths through the dam (See Photograph 12).

2. The valve controlling the upstream end of the low level outlet does not operate and is stuck in the open position.

3. Trees which had been growing on the right flank of the dam have died and their stumps removed leaving a series of holes in the downstream face. Small trees have been planted in their places (See Photograph 4).

4. There is no emergency action plan for the project.

c. Spillway and Tailrace

The stone masonry and concrete spillway which is located near the right abutment appears to be in good condition. At the time of inspection about 2 feet of flashboards were in place making a close inspection of the broad crested weir difficult. Water was flowing under and between gaps in the flashboards. The upstream channel contained a minor amount of debris

and the channel walls displayed a considerable amount of ice damage. The downstream channel was free of debris and in good condition with the exception of the training walls where the concrete covering the stone is in need of repair (See Photograph 9). The remainder of the tailrace channel which passes along the right flank over the top of the dam is in good condition.

d. Appurtenant Structures

The upstream control for the water supply outlet is inoperable and stuck in the open position.

e. Downstream Channel

The spillway tailrace channel passes along the right flank of the dam under the roadway and exits in a natural channel about 50 feet downstream of the dam. The channel contains a small amount of debris.

f. Abutments

The abutment dam contacts and the abutments are in good condition. There does not appear to be unstable conditions on the abutments.

g. Reservoir Area

There are neither slides, rock falls or sloughing areas around the reservoir. There were no sedimentation problems visible. There are however two unusual conditions in the reservoir area which could affect the stability of the dam, these are:

1. The close proximity of a large masonry dam, with a 25 foot high crest level just upstream of the reservoir.

2. A roadway embankment fill which crosses the reservoir near the left abutment contact (See Photograph 13).

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the inspection did not indicate any serious problems which would adversely affect the adequacy of the dam and appurtenant facilities. The following is a list, in order of importance, of problem areas encountered which should be corrected before further deterioration results in a hazardous condition. Appropriate remedies are also included.

1. The active erosion along the crest of the dam and the upstream face should be stopped and the existing damage repaired. This should be accomplished by removing the flashboards currently in place allowing the reservoir to drop 2 feet, reestablishing the original crest width and upstream slope and protecting the area with riprap.

2. All small trees, large trees which are dead, and large trees located near the crest should be cut down and their stumps removed. Larger trees on the downstream slope should be inventoried and their condition monitored. If one of these trees dies it should be cut down and the area around the stump should be monitored for the development of seepage. Depressions existing or created from the removal of trees should be backfilled with compacted materials.

3. The valves in the upstream intake house for the water supply pipe should be repaired or replaced.

4. The concrete on the spillway training walls should be repaired and the debris in the approach channel cleaned out.

5. A program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the moving parts of the water supply outlet system should be provided. This program should be documented for future reference. The emergency action plan described in Section 7.1d should be maintained and updated periodically during the life of the structure.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The White Plains Reservoir No.2 discharges as required for the City Water Supply through a 12 inch low level outlet. Operating procedures are based on an as-needed basis. Flow through the outlet is controlled by a valve downstream of the dam.

Flow through the spillway is controlled by flashboards inserted at the crest. Operation procedures for the spillway are governed by downstream flood conditions.

There is no formal operational manual for the dam or outlets.

4.2 MAINTENANCE OF THE DAM

There is no regular maintenance schedule for the dam. Maintenance is carried out by the staff of the City Water Works on an as-needed basis. Repair and maintenance programs have been carried out to maintain the embankment and spillway channel including removal of dead trees and patching of spillway concrete.

4.3 WARNING SYSTEM IN EFFECT

There are no warning systems in effect or in preparation.

4.4 EVALUATION

The overall maintenance of the White Plains Reservoir No.2 Dam is considered to be inadequate in the following areas.

1. The crest and upstream face of the dam have been allowed to erode.

2. Large trees have been allowed to grown on the downstream face. Dead trees have been removed leaving large holes in the downstream face. Small trees have been planted in their places, instead.

3. Concrete in the spillway training walls has been allowed to deteriorate.

4. No formal operation and maintenance manual exists for the project.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The White Plains Reservoirs are located on an unnamed tributary of the Bronx River, north of the city of White Plains in Silver Lake Park, Westchester County, New York (Hydrologic Unit Code No. 02030102). Reservoir No.2 is immediately downstream of reservoir No.1 and the combined drainage area of both reservoirs is 0.66 square miles. The basin, as outlined on a 1967 USGS Quadrangle map, is almost entirely woodland and meadows with very little development. The basin rises from a reservoir elevation of 242.0 ft to over 530 ft at Kennelwood Hill and is divided into many valleys with fairly steep side slopes. There are no defined stream channels upstream of the reservoirs and very little surface storage.

5.2 ANALYSIS CRITERIA

The analysis of the adequacy of the spillway was performed by developing a design flood, using the unit hydrograph method and the Probable Maximum Precipitation (PMP). The all season, 200 square mile 24 hour , PMF for the White Plains area (Zone 1) taken from Weather Bureau sources, was 22 inches. For the purpose of this analysis the basin was divided into two (2) sub-areas. Sub-area 1 runoff was routed through Reservoir No.1 and the outflow combined with runoff from Sub-area 2. The total runoff was then routed through Reservoir No.2. The inflow hydrograph was developed using average Snyder coefficients of 400 and 2.0, for 640 C_p & C_t, respectively. Rainfall losses of 2 inches initial loss and 0.1 inch/hour constant loss were used. In accordance with the "Recommended Guidelines for Safety Inspections of Dams", the adequacy of the spillway was analyzed using the Probable Maximum Flood (PMF). A multi-plan analysis was performed to test the spillway under the full, 0.75, 0.50, and 0.25 PMF.

5.3 SPILLWAY CAPACITY

The principal spillway is 13.0 feet in length, with a crest elevation of 242 feet (MSL). The vertical wingwalls are 4.0 feet high and at the time of inspection there were 2.0 feet of flashboards on the crest of the spillway. The computed maximum discharge capacity of the spillway with the reservoir water surface at elevation 246.0 ft (top of dam) is 340 cfs without the flashboards and 120 cfs with flashboards in place.

5.4 RESERVOIR CAPACITY

The normal capacity of the No.2 Reservoir is listed as 77 acre-feet. The computed surcharge storage between spillway crest elevation and the top of the dam is 115 acre-feet.

5.5 FLOODS OF RECORD

There are no records available of floods or maximum lake elevations.

5.6 OVERTOPPING POTENTIAL

The potential of the dam being overtopped was investigated on the basis of the spillway discharge capacity and the available surcharge storage to meet the selected design flood inflows.

The analysis was performed assuming that the lake level was at spillway crest elevation 242.0 feet with no flashboards at the start of the flood event. The computed inflow peak (PMF) is 2,114 cfs. The HEC-1DB analysis indicated that the spillway is capable of passing only 17 percent of the PMF outflow without the dam being overtopped. A summary of the results are as follows:

RATIO OF PMF	PEAK INFLOW	PEAK OUTFLOW	OVERTOPPING
1.00	2114 cfs	2063 cfs	0.95 feet
0.75	1585 cfs	1544 cfs	0.74 feet
0.50	1044 cfs	833 cfs	0.40 feet
0.25	362 cfs	193 cfs	0.00 feet

5.7 EVALUATION

The principal spillway of White Plains No. 2 Dam has insufficient capacity to pass either the PMF or one-half PMF without overtopping the dam. The overtopping of the dam could cause the failure of the dam thus significantly increasing the hazard for the loss of life downstream. The spillway is therefore assessed as being "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations did not indicate any existing structural problems with the embankment or appurtenant structures with the reservoir at its present level. There are adverse conditions which could have an effect on the stability of the dam. As detailed in Section 3, erosion of the crest and upstream face is at an advanced stage and is continuing. An eventual outcome of this process if it is left uncorrected is a breaching of the dam.

The spillway overflow sill appears to be structurally sound.

b. Design and Construction Data

Prints of the design drawing of the dam have been located in the files of the owner. A review of these prints does not reveal any structural stability problems or potential problems.

c. Operating Records

There are no operating records for the dam. Records, however, are kept of the water supply use. There are no records or reports of any operational problems which would effect the stability of the dam. One operation procedure which has affected the stability is the raising of the reservoir level by placing flashboards to raise the spillway crest level.

d. Post-Construction Changes

There are no reported post-construction changes to the dam other than the planting of trees on the downstream slope. Although unfavorable it is not possible to determine the exact effect of these trees on the stability of the dam.

e. Stability Analysis

There is no concrete gravity structure other than the spillway overflow sill. The overflow sill is a low height and based on the visual observations and engineering judgement, it is assessed as stable.

f. Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with recommended Phase I guidelines it does not warrant a seismic analysis.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Examination of available documents and visual inspection of the dam and the appurtenant structures did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

The earth embankment is considered to be stable under present conditions; however, the lack of freeboard and the erosion of the crest caused by the raising of the reservoir, through the insertion of flashboards in the spillway, presents a potentially hazardous condition. Under a higher than observed inflow or wind condition the overtopping of the dam and the breaching of the narrowed earth embankment is possible. The stability of the embankment is further endangered by the presence of the large masonry dam of unknown stability located upstream of the reservoir, and also because the road embankment, located left of the dam appears to be unstable.

Using the Corps of Engineer's Screening criteria for review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of the PMF. The overtopping of the dam could cause the erosion of both abutments and the downstream face of the dam resulting in dam failure, thus significantly increasing the hazard for loss of life downstream. The spillway is therefore adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard to loss of life downstream from the dam.

b. Adequacy of Information

This report and its conclusions are based on visual inspection, interviews, review of contract drawings and office hydrologic and hydraulic studies. This informatin and data are adequate for a Phase I inspection.

c. Need for Additional Investigations

Since the spillway is considered to be "seriously inadequate", additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. After the in-depth hydrologic/hydraulic investigations have been completed, remedial measures must be initiated to provide spillway capacity sufficient to discharge the outflow from the ½ PMF event.

Additionally it is recommended that a dambreak type study be performed to assess the effect of the upper reservoir on the safety of the lower dam.

d. Urgency

The additional hydrologic/hydraulic investigations which are required must be initiated within 3 months from the date of notification. Within 12 months of notification, remedial measures as a result of these investigations must be initiated, with completion of these measures during the following year. In the interim, an emergency action plan for the notification of downstream residents and proper governmental authorities in the event of overtopping should be developed, and around-the-clock surveillance of the dam during periods of extreme runoff should be provided. The other problem areas listed below must be corrected within 1 year from notification.

7.2 RECOMMENDED MEASURES

Recommended measures are as follows:

1. The active erosion along the crest of the dam and the upstream face should be stopped and the existing damage repaired. This should be accomplished by removing the flashboards currently in place allowing the reservoir to drop about 2 feet, reestablishing the original crest width and the upstream slope and protecting the area with riprap.

2. All small trees, dead large trees and large trees located near the crest should be cut down and removed. Larger trees on the downstream slope should be inventoried and their condition monitored. If one of these trees dies it should be cut down and the area around the stump should be monitored for the development of seepage. All depressions existing or resulting from the removal of trees should be backfilled with compacted material.

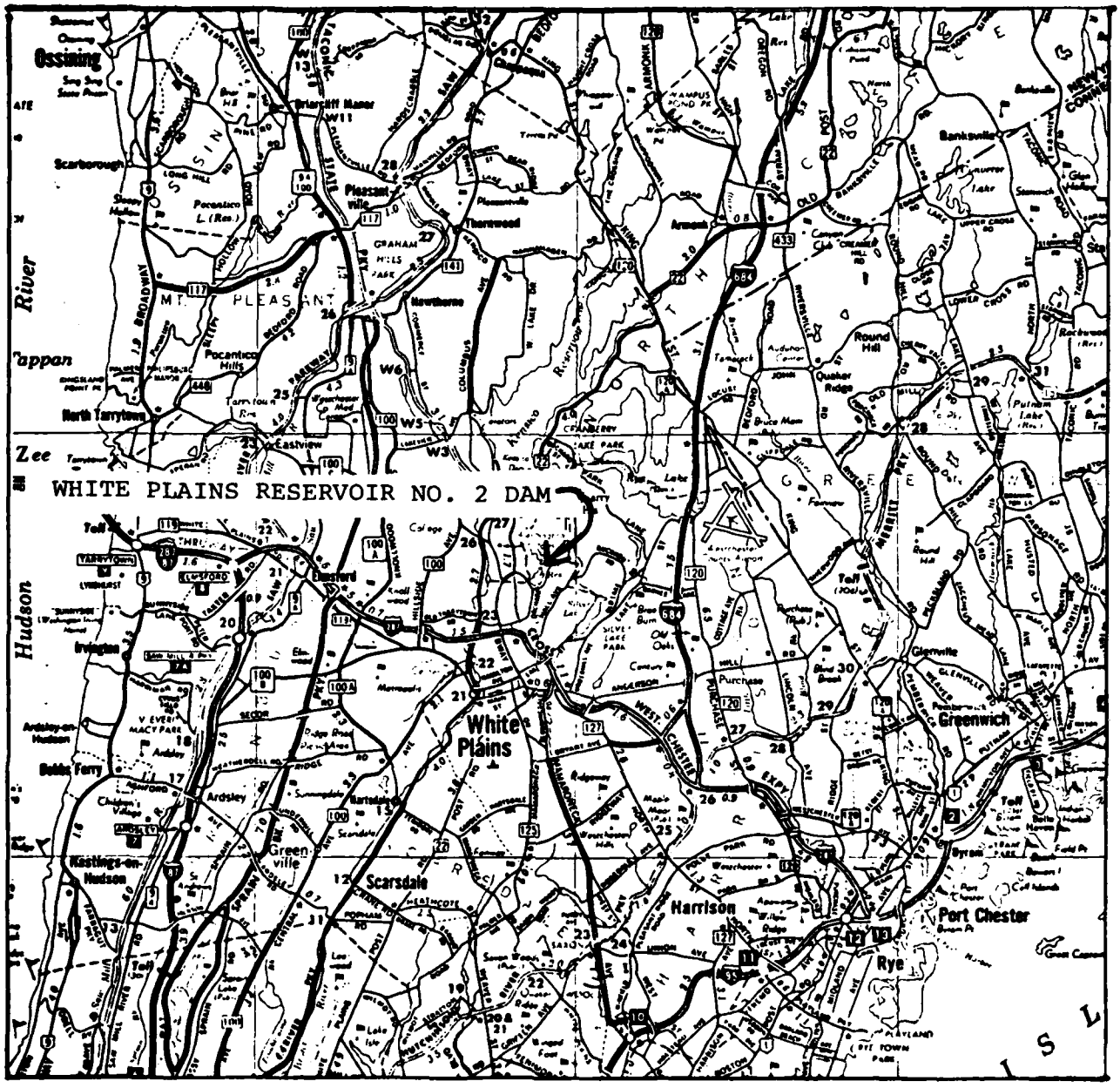
3. The valves in the upstream intake house for the water supply pipe should be repaired for replaced.

4. The concrete on the spillway training walls should be repaired and the debris in the approach channel cleaned out.

5. A program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the repaired gates should be provided. This program should be documented for future reference. The emergency action plan, described in Section 7.1d, should be maintained and updated periodically during the life of the structure.

DRAWINGS

APPENDIX A



Scale 1" = 2.2 miles

WHITE PLAINS RESERVOIR NO. 2
DAM
VICINITY MAP

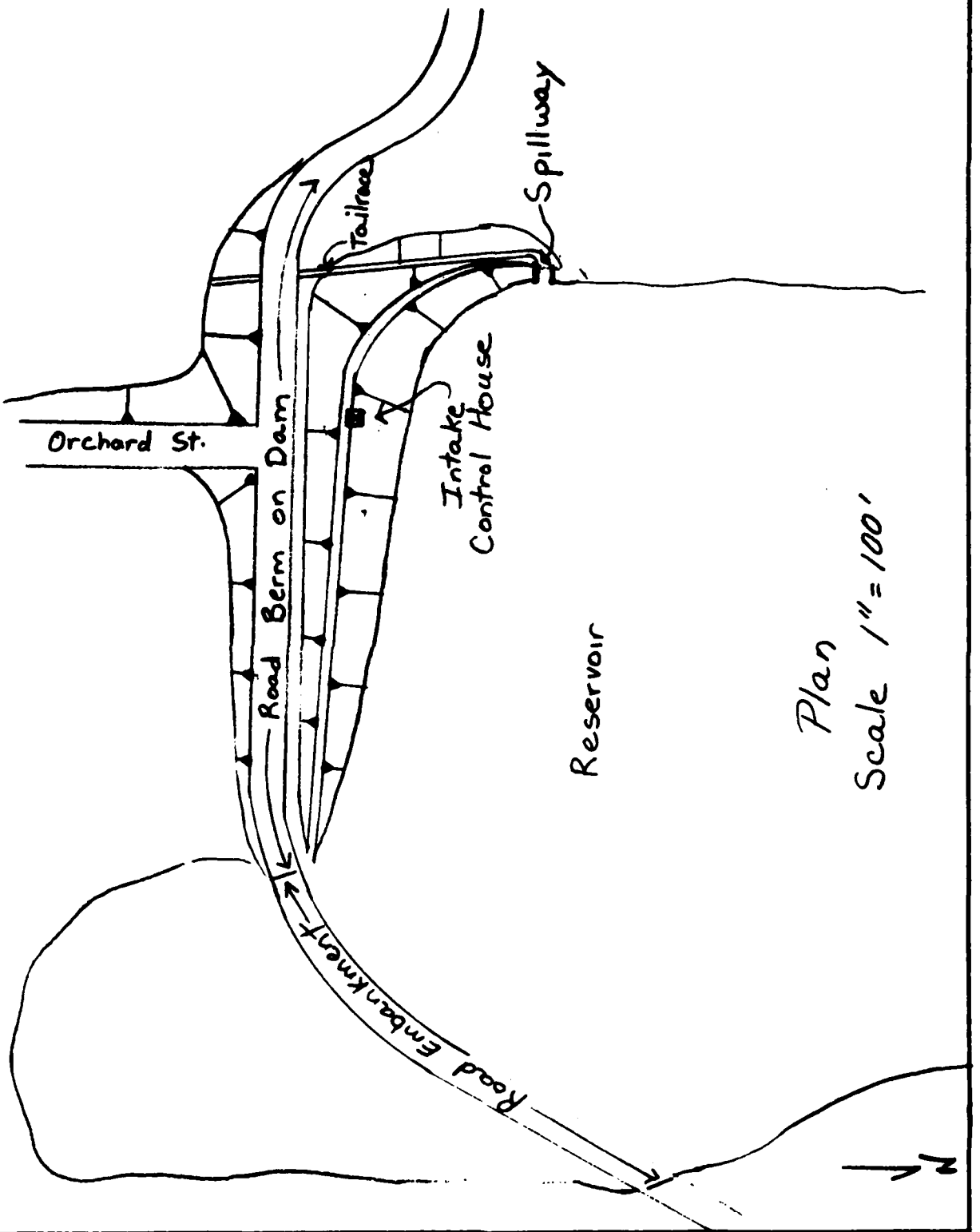
SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

WHITE PLAINS, NEW YORK QUAD TOPOGRAPHIC MAP

WHITE PLAINS RESERVOIR NO. 2 DAM



Plan
Scale 1" = 100'

TIPPETTS-ABBETT-McCARTHY-STRATTON
ENGINEERS AND ARCHITECTS NEW YORK

WHITE PLAINS RESERV.
No. 2 - DAM

BY: JF DATE: 5-'81

DWG:

PHOTOGRAPHS

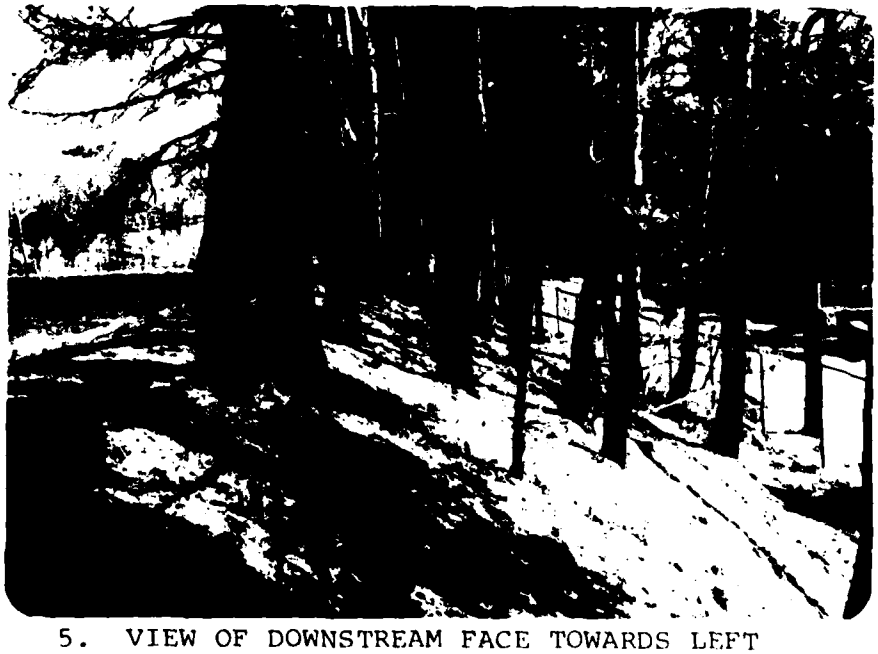
APPENDIX B

2. VIEW OF CREST FROM RIGHT ABUTMENT

3. VIEW OF CREST FROM VALVE HOUSE TOWARDS LEFT ABUTMENT

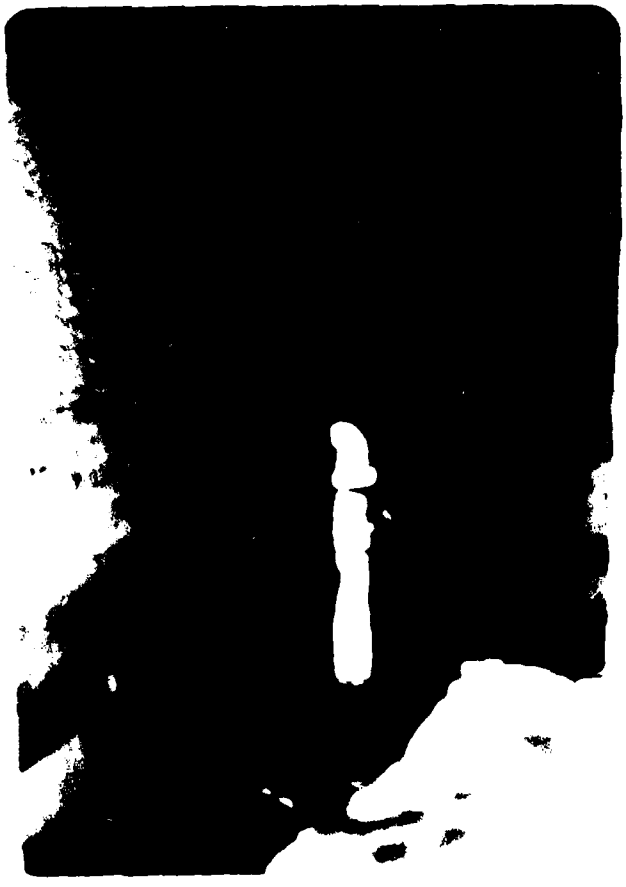
(NOTE: EXTENSIVE EROSION TO CREST IN BOTH PHOTOS)

4. VIEW OF DOWNSTREAM FACE TOWARDS RIGHT ABUTMENT (NOTE: TREE STUMPS AND HOLES)

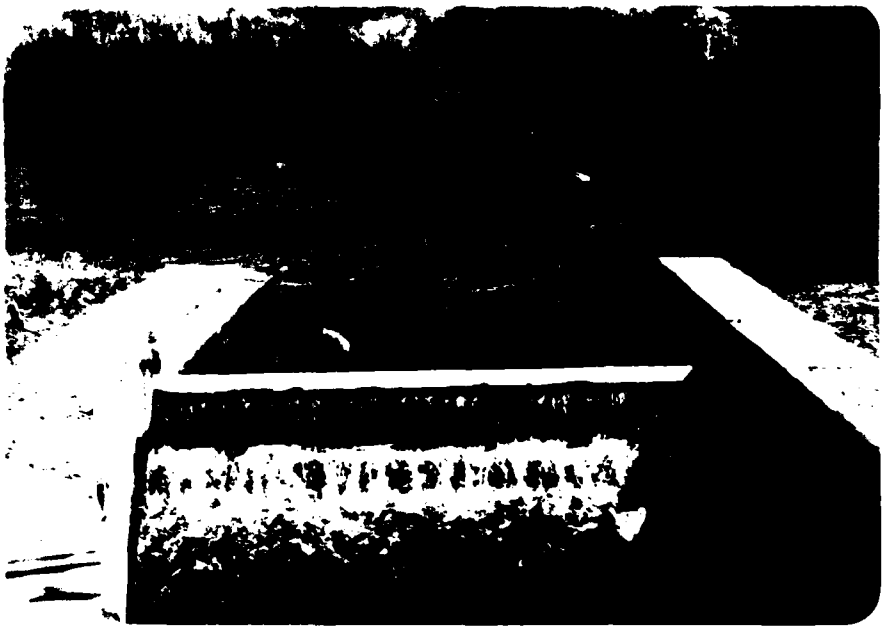


5. VIEW OF DOWNSTREAM FACE TOWARDS LEFT ABUTMENT (NOTE: LARGE TREES)

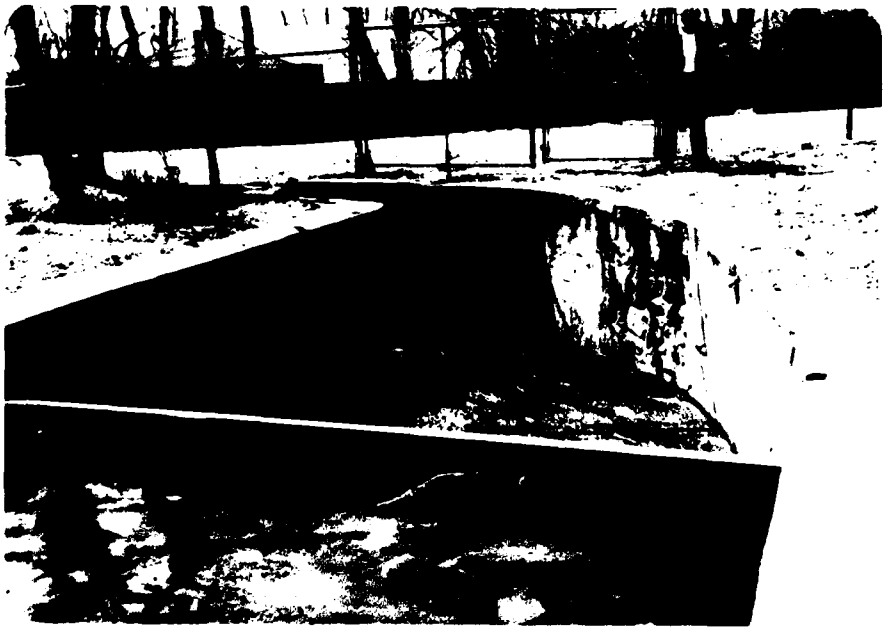
6. VIEW OF LOWER PART OF DOWNSTREAM FACE



7. VIEW OF INTERIOR OF VALVE HOUSE



8. VIEW OF SPILLWAY LOOKING UPSTREAM
(NOTE: FLASHBOARDS)



9. VIEW OF SPILLWAY LOOKING DOWNSTREAM
(NOTE: DETERIORATED CONCRETE IN WALLS)

10. SPILLWAY TAILRACE SHOOT ALONG RIGHT FLANK OF DAM

11. SPILLWAY TAILRACE SHOOT PASSING UNDER ROAD CONSTRUCTED ON BERM OF DAM

12. CLOSE-UP VIEW SHOWING EXTENT OF CREST EROSION NEAR THE VALVE HOUSE

13. ROAD PASSING ACROSS RESERVOIR NEAR LEFT ABUTMENT

VISUAL INSPECTION CHECKLIST

APPENDIX C

VISUAL INSPECTION CHECKLIST

1. Basic Data

a. General

Name of Dam White Plains Reservoir No 2 Dam

Fed. I.D. # NY 00024 DEC Dam No. 274

River Basin LONG ISLAND

Location: Town White Plains County Westchester

Stream Name TR. Bronx River

Tributary of Bronx River

Latitude (N) 41-03.2 Longitude (W) 73-45.7

Type of Dam Earth

Hazard Category HIGH (1)

Date(s) of Inspection April 2, 1981

Weather Conditions FAIR 60°-65° F

Reservoir Level at Time of Inspection Elev 244-(2 Ft. of Flashboards in place)

b. Inspection Personnel Kalman Szaky, Joe Fiteni JR.

c. Persons Contacted (Including Address & Phone No.)

Mr Leo Amdeo - Supt. of Works, Orchard Street pumping station, White Plains, New York 10601

d. History:

Date Constructed 1907 Date(s) Reconstructed

Designer Wm. Collyer

Constructed By Unknown

Owner City of White Plains

Embankment

a. Characteristics

(1) Embankment Material Compacted earth fill

(2) Cutoff Type Rubble masonry corewall down to rock.

(3) Impervious Core Rubble Masonry Core Wall

(4) Internal Drainage System None present

(5) Miscellaneous Upstream Face covered by riprap underlain by sand and gravel layers

b. Crest

(1) Vertical Alignment OK

(2) Horizontal Alignment Irregular extensive erosion on upstream face has led to sloughing of crest

(3) Surface Cracks Some due to upstream erosion

(4) Miscellaneous Crest width has been significantly reduced from original 10 foot width, to less then 4 feet in some areas to upstream erosion

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1V:2H

(2) Undesirable Growth or Debris, Animal Burrows Some tree growth near crest - especially on left abutment

(3) Sloughing, Subsidence or Depressions Extensive sloughing at crest due to erosion by wave action. Continuous along entire crest length in varying amounts.

(4) Slope Protection Shown on original drawings but not visible in the field.

(5) Surface Cracks or Movement at Toe not observable

d. Downstream Slope

(1) Slope (Estimate - V:H) 1V:2H

(2) Undesirable Growth or Debris, Animal Burrows Left of gate house Covered by large (18"ø) conifers Right Side by small recently planted trees

(3) Sloughing, Subsidence or Depressions Large depressions present on right side of dam due to tree removal No Sloughing or other Subsidence present

(4) Surface Cracks or Movement at Toe None visible

(5) Seepage None visible

(6) External Drainage System (Ditches, Trenches; Blanket) None present

(7) Condition Around Outlet Structure No structure present

(8) Seepage Beyond Toe None visible

e. Abutments - Embankment Contact

OK

(1) Erosion at Contact None Visible

(2) Seepage Along Contact None Visible

3) Drainage System

a. Description of System None present

b. Condition of System NA

c. Discharge from Drainage System NA

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) None present

) Reservoir

a. Slopes No slides or instability observed.

b. Sedimentation No unusual amounts present

c. Unusual Conditions Which Affect Dam Large Masonry dam - 25 Ft higher elevation 250' directly upstream of reservoir

b). Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Developed Suburban area - 1/4 mile downstream. Houses directly adjacent to dam downstream.

b. Seepage, Unusual Growth Some trees and brush in downstream area bdow roadway berm

c. Evidence of Movement Beyond Toe of Dam None

d. Condition of Downstream Channel Some debris and growth

Spillway(s) (Including Discharge Conveyance Channel)

one broad crested spillway channel - 3½-4 Feet deep 13 ft wide

a. General Spillway channel has downstream tailrace which has 90° tailrace bend and contracts to 3ft wide, 4ft deep stone lined rectangular channel.

b. Condition of Service Spillway Good overall condition some local concrete cracking and missing facing in downstream tailrace area. Area upstream behind flashboards clogged with debris.

c. Condition of Auxiliary Spillway None present

d. Condition of Discharge Conveyance Channel Stone masonry lined channel in good condition

3) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal ✓ Other _____

Size: 12 inch Length Not known

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): Unobservable ✓

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

_____

Hydraulic Capability: _____

_____

Means of Control: Gate _____ Valves (2) upstream downstream Uncontrolled _____

Operation: Operable-downstream Inoperable upstream Other _____

Present Condition (Describe): _____

_____

9) Structural

a. Concrete Surfaces See Item 7

b. Structural Cracking See Item 7

c. Movement - Horizontal & Vertical Alignment (Settlement) NA

d. Junctions with Abutments or Embankments See Item 7

e. Drains - Foundation, Joint, Face NA

f. Water Passages, Conduits, Sluices See Item 7

g. Seepage or Leakage NA

h. Joints - Construction, etc. See item 7

i. Foundation NA

j. Abutments NA

k. Control Gates See items 7 and

l. Approach & Outlet Channels See items 7 and 8

m. Energy Dissipators (Plunge Pool, etc.) NA

n. Intake Structures NA

o. Stability NA

p. Miscellaneous NA

10) Appurtenant Structures (Powerhouse, Lock, Gatehouse, Other)

a. Description and Condition WATER Supply intake in gatehouse located in center of dam on upstream face. Condition described in items 5-9.

White Plains

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX D

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	246	29.6±	192
2) Design High Water (Max. Design Pool)	244		
3) Auxiliary Spillway Crest	—		
4) Pool Level with Flashboards	244	28.75	133
5) Service Spillway Crest	242	28	77

DISCHARGES

	Volume (cfs)
1) Average Daily	unknown
2) Spillway @ Maximum High Water w/o Flashboards	340
3) Spillway @ Design High Water	—
4) Spillway @ Auxiliary Spillway Crest Elevation	—
5) Low Level Outlet 12 inch water supply pipe	insignificant
6) Total (of all facilities) @ Maximum High Water	340
7) Maximum Known Flood	unknown
8) At Time of Inspection	unknown

CREST: Unpaved EARTH ELEVATION: 246.0

Type: EARTH

Width: 10 feet Length: 550 Ft

Spillover Stone masonry Weir

Location Right abunient

SPILLWAY:

SERVICE		AUXILIARY
242	Elevation	
Broad Crested Weir	Type	
13 Feet	Width	
	Type of Control	
	Uncontrolled	
	Controlled:	
Flashboards	Type (Flashboards; gate)	
6	Number	
6 inch high - 13 foot long	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
Greater than 500 ft	Chute Length	
Horizontal	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES: None Used

Type : _____

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: None

_____

Method of Controlled Releases (mechanisms):

_____

_____

DRAINAGE AREA: 0.66 Sq miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Woodlands and Meadows

Terrain - Relief: Fairly Steep Slopes with many valleys

Surface - Soil:

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

unknown

Potential Sedimentation problem areas (natural or man-made; present or future)

unknown

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

Outflow channel capacity very small it is estimated that road on d/s of dam would be overtopped by discharge from 1/2 PMF

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: None

Elevation:

Reservoir:

Length @ Maximum Pool 0.3 (Miles)

Length of Shoreline (@ Spillway Crest) 0.8 (Miles)

TAMS

Job No. 1579-05 Sheet 1 of 29

Project WHITE PLAIN RESERVOIR DAM NO. 2. Date APRIL 1981

Subject: Hydrologic/Hydraulic Computations. By DLC

Ch'k. by

From Hydromet No. 33.

All Season 200 Sq mile 24 hour PMP ~ 22 inches

ZONE 1

Percent to be applied for point (10 sq mile) rainfall

Durat'n	6 HRS	12 HRS	24 HRS	48 HRS
%	111	123	133	142

BASIN LOSSES	% Impervious	Inital	Constant
Sub-basin 1	14.8%	2	0.1
Sub-basin 2	5.9%	2	0.1

USE AVERAGE SNYDER COEF.

640 C_p = 400 C_T = 2

C_p =

① $L_{(1.1')}$ = 3400' = 0.64 mi $L_{CA_{(.6')}}$ = 1200' = 0.23 mi

② $L_{(1.5')}$ = 3000' = 0.57 mi $L_{CA_{(0.5')}}$ = 1000' = 0.19 mi

T_p for No 1 = $C_T (LL_{CA})^{0.3}$ = 1.13 hours

T_p for No 2 = $C_T (LL_{CA})^{0.3}$ = 1.03 hours

TAMS

Job No. 1579-05
Project WHITE PLAINS DAM NO 2
Subject HYDROLOGIC/HYDRAULIC COMPUTATIONS

Sheet 2 of 29
Date APRIL 81
By DLC
Ch'k. by

SPILLWAY RATING $Q = CLH^{3/2}$

LENGTH = 13.0 CREST 242.0 ft MSL

NO FLASHBOARDS

El.	h	C	Q
242	0	0	0
244	2	3.26	120
246	4	3.27	340
250	8	3.30	970
255	13	3.30	2010

TOP OF DAM EL 246

LENGTH OF DAM 550.

ASSUME CRITICAL FLOW OVER DAM

& $C = 3.1$.

$Q_{DAM} = (3.1)(550) H^{3/2}$

TAMS

Job No. 1579-05 Sheet 3 of 29

Project

Subject WHITE PLAINS RESERVOIR AREA - SURCHARGE STORAGE

Date MAR 13 1981

By DLC

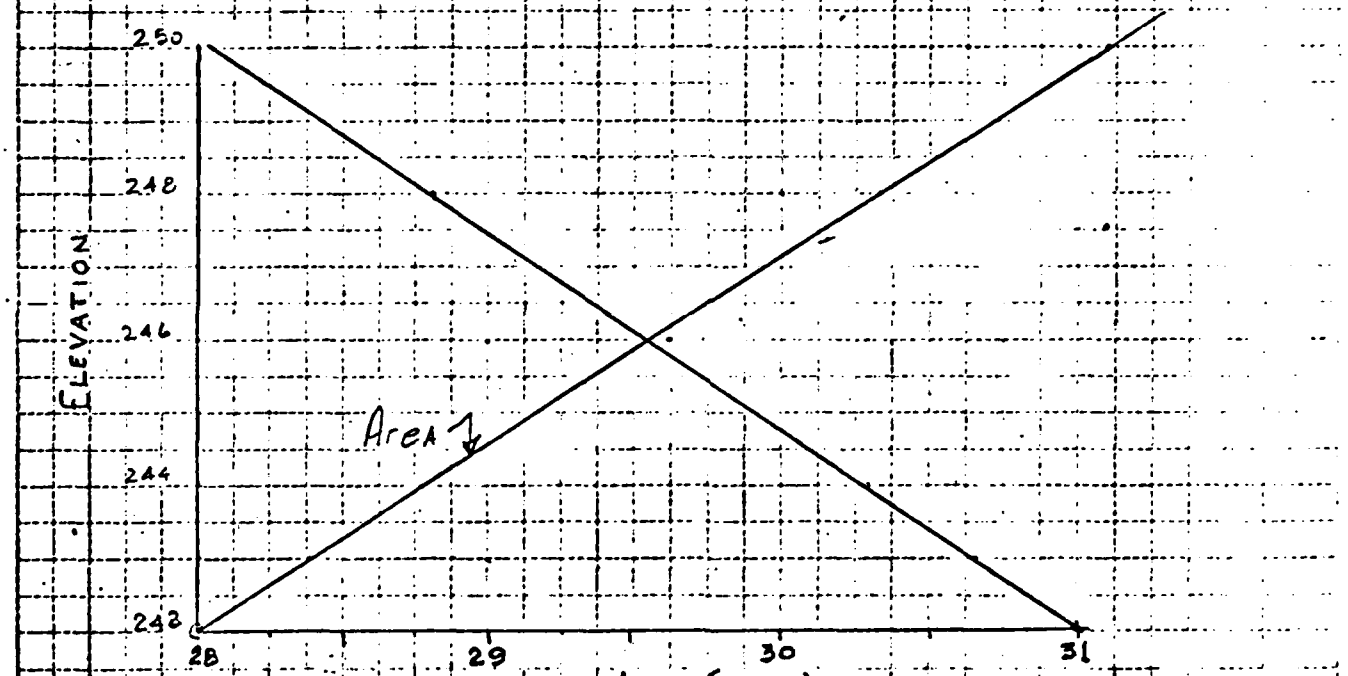
Ch'k. by

LAKE AREA 28.01 acres at ELEV 242 MSL

250 CONTOUR 31.22 acres.

SURCHARGE

AC FT 240 200 160 120 100 80 40 0



EL	ΔEL	Area	Mean Area	Δ Vol	Surcharge	Capacity
242		28.01			0	77
	1		28.2	28.2		
243		28.39			28.2	105
	1		28.58	28.58		
244		28.78			56.78	134
	2		29.17	58.34		
246		29.55			115.12	192
	2		30.0	60.00		
248		30.46			175.12	
	2		30.84	61.68		
250		31.22			236.8	314

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION  01 APR 80
**********
    1          A1                    WHITE PLAINS RESERVOIR NO 2
    2          A2                    PHASE 1 DAM INSPECTION ,HEC.1DB PMF ANALYSIS
    3          A3                    APRIL 1981   TAMS    1579-05
    4          B    150      0       20       0       0       0       0       0       0       0
    5          B1     5
    6          J      1       4       1
    7          J1     1    0.75     0.5    0.25
    8          K      0       1                                       1
    9          K1       1 SUB-BASIN NO 1  INFLOW HYDROGRAPH                                    1
   10          M      1       1    C.36                0.66
   11          P                     22     111     123     133     142
   12          T                                                             2     0.1             .15
   13          W    1.13     0.6
   14          X      -1    -.05     1.6
   15          K      1       1                                               1
   16          K1       2 ROUTE HYDROGRAPH THROUGH RESERVOIR NO 1
   17          Y                                     1       1
   18          Y1     1                                                      50
   19          Y2    50      98     113     210
   20          Y3     0     170    1120   18000
   21          K      2       1                                               1
   22          K1       3 SUB-BASIN NO2  RUNOFF
   23          M      1       1     0.3                0.66                                    1
   24          P                     22     111     123     133     142
   25          T                                                             2     0.1             0.06
   26          W      1     0.6
   27          X      0    -.05     1.6
   28          K      2       1                                               1
   29          K1       4 COMPINE 2 HYDROGRAPHS
   30          K      1       2                                               1
   31          K1       5 ROUTE THROUGH RESERVOIR NO 2
   32          Y                                     1       1
   33          Y1     1                                                      77    -1
   34          Y4   242     244     246     250     255
   35          Y5     0     120     340     970    2010
   36          SS    77     105     134     314
   37          SE   242     243     244     250
   38          SA   242
   39          SD   246     3.1     1.5     550
   40          K     99
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	1
RUNOFF HYDROGRAPH AT	1
COMBINE 2 HYDROGRAPHS AT	1
ROUTE HYDROGRAPH TO	2
END OF NETWORK	

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  C1 APR 80
**********

RUN  DATE= 81/06/22.
     TIME= 11.03.35.


                    WHITE PLAINS RESERVOIR NO 2
                    PHASE 1 DAM INSPECTION .HEC.1DB PMF ANALYSIS
                    APRIL 1981   TAMS     1579-C5

                                JOB SPECIFICATION
      NQ     NHR     NMIN     IDAY     IHR     IMIN    METRC     IPLT     IPRT    NSTAN
     150       0       20        0       0        0        0        0        0        0
                          JOPER      NWT    LROPT    TRACE
                              5        0        0        0

                        MULTI-PLAN ANALYSES TO BE PERFORMED
                                NPLAN= 1 NRTIO= 4 LRTIO= 1
                RTIOS=  1.00     .75     .50     .25

**********      **********      **********      **********      **********

                            SUB-AREA RUNOFF COMPUTATION

                1 SUB-BASIN NO 1  INFLOW HYDROGRAPH                    1

                          ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                              1       0       0       0       0       0       1       0       0

                                HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO   ISNOW   ISAME   LOCAL
              1        1      .36     0.00      .66     0.00    0.000       0       0       0

                                PRECIP DATA
                SPFE      PMS       R6      R12      R24      R48      R72      R96
                0.00    22.00   111.00   123.00   133.00   142.00     0.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS  .600

                                LOSS DATA
      LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
          0     0.00     0.00     1.00     0.00     0.00     1.00     2.00      .10     0.00      .15

                            UNIT HYDROGRAPH DATA
                        TP=  1.13     CP= .60     NTA=  0

                                RECESSION DATA
                        STRTQ=    -1.00     QRCSN=     -.05     RTIOR= 1.60
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.40 AND R= 3.36 INTERVALS

                UNIT HYDROGRAPH 20 END-OF-PERIOD ORDINATES, LAG=  1.13 HOURS, CP=  .60  VOL= 1.00
      17.      59.     103.     120.     103.      76.      57.      42.      31.      23.
      17.      13.       9.       7.       5.       4.       3.       2.       2.       1.
```

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
						END-OF-PERIOD FLOW							
1.01	.20	1	.00	.00	.00	0.	1.02	1.20	76	.04	.01	.03	2.
1.01	.40	2	.00	.00	.00	0.	1.02	1.40	77	.04	.01	.03	3.
1.01	1.00	3	.00	.00	.00	0.	1.02	2.00	78	.04	.01	.03	3.
1.01	1.20	4	.00	.00	.00	0.	1.02	2.20	79	.04	.01	.03	3.
1.01	1.40	5	.00	.00	.00	0.	1.02	2.40	80	.04	.01	.03	3.
1.01	2.00	6	.00	.00	.00	0.	1.02	3.00	81	.04	.01	.03	4.
1.01	2.20	7	.00	.00	.00	0.	1.02	3.20	82	.04	.01	.03	4.
1.01	2.40	8	.00	.00	.00	0.	1.02	3.40	83	.04	.01	.03	4.
1.01	3.00	9	.00	.00	.00	0.	1.02	4.00	84	.04	.01	.03	4.
1.01	3.20	10	.00	.00	.00	0.	1.02	4.20	85	.04	.01	.03	5.
1.01	3.40	11	.00	.00	.00	0.	1.02	4.40	86	.04	.01	.03	5.
1.01	4.00	12	.00	.00	.00	0.	1.02	5.00	87	.04	.01	.03	6.
1.01	4.20	13	.00	.00	.00	0.	1.02	5.20	88	.04	.01	.03	6.
1.01	4.40	14	.00	.00	.00	0.	1.02	5.40	89	.04	.01	.03	6.
1.01	5.00	15	.00	.00	.00	0.	1.02	6.00	90	.04	.01	.03	7.
1.01	5.20	16	.00	.00	.00	0.	1.02	6.20	91	.12	.09	.03	8.
1.01	5.40	17	.00	.00	.00	0.	1.02	6.40	92	.12	.09	.03	13.
1.01	6.00	18	.00	.00	.00	0.	1.02	7.00	93	.12	.09	.03	21.
1.01	6.20	19	.01	.00	.01	0.	1.02	7.20	94	.12	.09	.03	31.
1.01	6.40	20	.01	.00	.01	0.	1.02	7.40	95	.12	.09	.03	39.
1.01	7.00	21	.01	.00	.01	1.	1.02	8.00	96	.12	.09	.03	45.
1.01	7.20	22	.01	.00	.01	1.	1.02	8.20	97	.12	.09	.03	49.
1.01	7.40	23	.01	.00	.01	1.	1.02	8.40	98	.12	.09	.03	53.
1.01	8.00	24	.01	.00	.01	1.	1.02	9.00	99	.12	.09	.03	55.
1.01	8.20	25	.01	.00	.01	1.	1.02	9.20	100	.12	.09	.03	57.
1.01	8.40	26	.01	.00	.01	1.	1.02	9.40	101	.12	.09	.03	58.
1.01	9.00	27	.01	.00	.01	1.	1.02	10.00	102	.12	.09	.03	59.
1.01	9.20	28	.01	.00	.01	1.	1.02	10.20	103	.12	.09	.03	60.
1.01	9.40	29	.01	.00	.01	1.	1.02	10.40	104	.12	.09	.03	60.
1.01	10.00	30	.01	.00	.01	1.	1.02	11.00	105	.12	.09	.03	61.
1.01	10.20	31	.01	.00	.01	1.	1.02	11.20	106	.12	.09	.03	61.
1.01	10.40	32	.01	.00	.01	1.	1.02	11.40	107	.12	.09	.03	61.
1.01	11.00	33	.01	.00	.01	1.	1.02	12.00	108	.12	.09	.03	61.
1.01	11.20	34	.01	.00	.01	1.	1.02	12.20	109	.65	.62	.03	70.
1.01	11.40	35	.01	.00	.01	1.	1.02	12.40	110	.65	.62	.03	102.
1.01	12.00	36	.01	.00	.01	1.	1.02	13.00	111	.65	.62	.03	157.
1.01	12.20	37	.04	.01	.04	1.	1.02	13.20	112	.78	.75	.03	223.
1.01	12.40	38	.04	.01	.04	1.	1.02	13.40	113	.78	.75	.03	286.
1.01	13.00	39	.04	.01	.04	2.	1.02	14.00	114	.78	.75	.03	340.
1.01	13.20	40	.05	.01	.04	3.	1.02	14.20	115	.98	.95	.03	389.
1.01	13.40	41	.05	.01	.04	3.	1.02	14.40	116	.98	.95	.03	437.
1.01	14.00	42	.05	.01	.04	4.	1.02	15.00	117	.98	.95	.03	483.
1.01	14.20	43	.07	.01	.06	4.	1.02	15.20	118	1.71	1.68	.03	539.
1.01	14.40	44	.07	.01	.06	5.	1.02	15.40	119	4.68	4.65	.03	666.
1.01	15.00	45	.07	.01	.06	5.	1.02	16.00	120	1.04	1.01	.03	882.
1.01	15.20	46	.12	.02	.10	6.	1.02	16.20	121	.91	.88	.03	1078.
1.01	15.40	47	.32	.05	.27	7.	1.02	16.40	122	.91	.88	.03	1140.
1.01	16.00	48	.07	.01	.06	9.	1.02	17.00	123	.91	.88	.03	1063.
1.01	16.20	49	.06	.01	.05	11.	1.02	17.20	124	.72	.69	.03	945.
1.01	16.40	50	.06	.01	.05	12.	1.02	17.40	125	.72	.69	.03	848.
1.01	17.00	51	.06	.01	.05	11.	1.02	18.00	126	.72	.69	.03	763.
1.01	17.20	52	.05	.01	.04	10.	1.02	18.20	127	.06	.03	.03	682.
1.01	17.40	53	.05	.01	.04	9.	1.02	18.40	128	.06	.03	.03	587.
1.01	18.00	54	.05	.01	.04	8.	1.02	19.00	129	.06	.03	.03	478.
1.01	18.20	55	.00	.00	.00	7.	1.02	19.20	130	.06	.03	.03	369.
1.01	18.40	56	.00	.00	.00	6.	1.02	19.40	131	.06	.03	.03	278.

1.01	19.00	57	.00	.00	.00	5.	1.02	20.00	132	.06	.03	.03	211.
1.01	19.20	58	.00	.00	.00	4.	1.02	20.20	133	.06	.03	.03	161.
1.01	19.40	59	.00	.00	.00	3.	1.02	20.40	134	.06	.03	.03	124.
1.01	19.60	60	.00	.00	.00	2.	1.02	21.00	135	.06	.03	.03	97.
1.01	19.80	61	.00	.00	.00	2.	1.02	21.20	136	.06	.03	.03	76.
1.01	20.00	62	.00	.00	.00	1.	1.02	21.40	137	.06	.03	.03	61.
1.01	20.20	63	.00	.00	.00	1.	1.02	22.00	138	.06	.03	.03	55.
1.01	20.40	64	.00	.00	.00	1.	1.02	22.20	139	.06	.03	.03	53.
1.01	20.60	65	.00	.00	.00	1.	1.02	22.40	140	.06	.03	.03	50.
1.01	20.80	66	.00	.00	.00	1.	1.02	23.00	141	.06	.03	.03	48.
1.01	21.00	67	.00	.00	.00	1.	1.02	23.20	142	.06	.03	.03	46.
1.01	21.20	68	.00	.00	.00	1.	1.02	23.40	143	.06	.03	.03	44.
1.01	21.40	69	.00	.00	.00	1.	1.03	0.00	144	.06	.03	.03	42.
1.01	21.60	70	.00	.00	.00	1.	1.03	.20	145	0.00	0.00	0.00	40.
1.01	21.80	71	.00	.00	.00	0.	1.03	.40	146	0.00	0.00	0.00	38.
1.02	0.00	72	.00	.00	.00	0.	1.03	1.00	147	0.00	0.00	0.00	36.
1.02	.20	73	.04	.01	.03	1.	1.03	1.20	148	0.00	0.00	0.00	35.
1.02	.40	74	.04	.01	.03	1.	1.03	1.40	149	0.00	0.00	0.00	33.
1.02	1.00	75	.04	.01	.03	1.	1.03	2.00	150	0.00	0.00	0.00	31.
									SUM	24.99	21.55	3.44	15171.
										(635.)	(547.)	(87.)	(429.59)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1140.	665.	208.	101.	15163.
CMS	32.	19.	6.	3.	429.
INCHES		17.19	21.51	21.77	21.77
MM		436.51	546.35	552.87	552.87
AC-FT		330.	413.	418.	418.
THOUS CU M		407.	509.	515.	515.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	3.
3.	4.	4.	5.	5.	6.	7.	9.	11.	12.
11.	10.	9.	8.	7.	6.	5.	4.	3.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	1.	1.	1.	2.	3.	3.	3.	3.
4.	4.	4.	4.	5.	5.	6.	6.	6.	7.
8.	13.	21.	31.	39.	45.	49.	53.	55.	57.
58.	59.	60.	60.	61.	61.	61.	61.	70.	102.
157.	223.	286.	340.	389.	437.	483.	539.	666.	882.
1078.	1140.	1063.	945.	848.	763.	682.	587.	478.	369.
278.	211.	161.	124.	97.	76.	61.	55.	53.	50.
48.	46.	44.	42.	40.	39.	36.	35.	33.	31.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1140.	665.	208.	101.	15163.
CMS	32.	19.	6.	3.	429.
INCHES		17.19	21.51	21.77	21.77
MM		436.51	546.35	552.87	552.87
AC-FT		330.	413.	418.	418.
THOUS CU M		407.	509.	515.	515.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	3.	3.	4.	4.	4.	5.	7.	8.	9.
8.	7.	7.	6.	5.	5.	4.	3.	2.	2.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	2.	2.	2.	3.
3.	3.	3.	3.	4.	4.	5.	5.	5.	5.
6.	10.	16.	23.	29.	34.	37.	39.	41.	43.
44.	44.	45.	45.	46.	46.	46.	46.	53.	77.
118.	168.	215.	255.	292.	327.	363.	404.	499.	662.
809.	855.	797.	709.	636.	573.	511.	441.	359.	276.
209.	158.	121.	93.	73.	57.	46.	42.	40.	38.
36.	34.	33.	31.	30.	29.	27.	26.	25.	24.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	855.	499.	156.	76.	11272.
CMS	24.	14.	4.	2.	322.
INCHES		12.89	16.13	16.32	16.32
MM		327.38	409.76	414.65	414.65
AC-FT		247.	310.	313.	313.
THOUS CU M		305.	382.	386.	386.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	1.	1.	1.
2.	2.	2.	2.	3.	3.	3.	5.	6.	6.
6.	5.	4.	4.	4.	3.	3.	2.	2.	1.
1.	1.	1.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	2.	2.
2.	2.	2.	2.	2.	3.	3.	3.	3.	3.
4.	7.	11.	15.	19.	22.	25.	26.	27.	28.
29.	30.	30.	30.	30.	31.	31.	31.	35.	51.
79.	112.	143.	170.	195.	218.	242.	269.	333.	441.
539.	570.	531.	473.	424.	382.	341.	294.	239.	184.
139.	105.	81.	62.	48.	38.	31.	28.	26.	25.
24.	23.	22.	21.	20.	19.	18.	17.	17.	16.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	570.	333.	104.	51.	7581.
CMS	16.	9.	3.	1.	215.
INCHES		8.59	10.75	10.88	10.88
MM		218.26	273.18	276.43	276.43
AC-FT		165.	206.	209.	209.
THOUS CU M		203.	255.	258.	258.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
1.	1.	1.	1.	1.	1.	2.	2.	3.	3.

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3.	2.	2.	2.	2.	2.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
2.	3.	5.	8.	10.	11.	12.	13.	14.	14.
15.	15.	15.	15.	15.	15.	15.	15.	18.	26.
39.	56.	72.	85.	97.	109.	121.	135.	166.	221.
270.	285.	266.	236.	212.	191.	170.	147.	120.	92.
70.	53.	40.	31.	24.	19.	15.	14.	13.	13.
12.	11.	11.	10.	10.	9.	9.	9.	8.	8.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	285.	166.	52.	25.	3791.
CMS	8.	5.	1.	1.	107.
INCHES		4.30	5.38	5.44	5.44
MM		109.13	136.59	138.22	138.22
AC-FT		82.	103.	104.	104.
THOUS CU M		102.	127.	129.	129.

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HYDROGRAPH ROUTING

2 ROUTE HYDROGRAPH THROUGH RESERVOIR NO 1

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	50.	0

STORAGE	50.00	98.00	113.00	210.00
OUTFLOW	0.00	170.00	1120.00	18000.00

STATION 1, PLAN 1, RTIO 1

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	3.	3.	4.	5.
5.	6.	6.	6.	6.	6.	6.	6.	6.	6.
5.	5.	5.	4.	4.	4.	3.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	3.	3.	3.	3.	3.	4.	4.	4.
4.	5.	6.	9.	10.	13.	16.	20.	23.	26.
29.	32.	34.	37.	39.	41.	43.	45.	47.	50.
55.	70.	87.	108.	132.	154.	333.	499.	595.	762.
965.	1100.	1101.	1011.	904.	812.	729.	641.	540.	431.
331.	250.	190.	168.	162.	155.	147.	139.	131.	124.
117.	110.	104.	98.	93.	88.	83.	79.	75.	71.

Sheet 10 of 29

STOR

50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	51.	51.	51.	51.	51.	51.	51.
51.	52.	52.	52.	52.	52.	52.	52.	52.	52.
52.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	51.	52.	52.	53.	54.	55.	56.	56.	57.
58.	59.	60.	60.	61.	62.	62.	63.	63.	64.
66.	70.	75.	81.	87.	95.	101.	103.	105.	107.
111.	113.	113.	111.	110.	108.	107.	105.	104.	102.
101.	99.	98.	97.	96.	94.	92.	89.	87.	85.
83.	81.	79.	78.	76.	75.	74.	72.	71.	70.

STAGE

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1101.	631.	198.	96.	14439.
CMS	31.	18.	6.	3.	409.
INCHES		16.30	20.50	20.73	20.73
MM		414.12	520.67	526.45	526.45
AC-FT		313.	393.	398.	398.
THOUS CU M		386.	485.	491.	491.

MAXIMUM STORAGE = 113.

STATION 1, PLAN 1, RTIO 2

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	2.	2.	3.	3.
4.	4.	5.	5.	5.	5.	5.	5.	4.	4.
4.	4.	5.	5.	4.	3.	3.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	3.	3.	3.

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3.	4.	5.	6.	8.	10.	12.	15.	17.	19.
22.	24.	26.	27.	29.	31.	32.	33.	35.	38.
43.	52.	65.	81.	99.	119.	140.	162.	363.	566.
724.	825.	826.	759.	678.	609.	546.	481.	405.	323.
243.	188.	167.	162.	154.	146.	137.	129.	120.	113.
106.	99.	93.	87.	82.	77.	73.	68.	64.	61.

S ER

50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	51.	51.	51.	51.	51.
51.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	51.	51.	52.	52.	53.	53.	54.	55.	55.
56.	57.	57.	58.	58.	59.	59.	59.	60.	61.
62.	65.	68.	73.	78.	84.	89.	96.	101.	104.
107.	106.	106.	107.	106.	105.	104.	103.	102.	100.
99.	98.	97.	96.	94.	91.	89.	86.	84.	82.
80.	78.	76.	75.	73.	72.	70.	69.	68.	67.

STAGE

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	826.	454.	148.	72.	10751.
CMS	23.	13.	4.	2.	304.
INCHES		11.74	15.26	15.43	15.43
MM		298.20	387.69	392.02	392.02
AC-FT		225.	293.	296.	296.
THOUS CU M		278.	361.	365.	365.

MAXIMUM STORAGE = 108.

STATION 1, PLAN 1, RTIO 3

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Sheet 12 of 29

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	2.
2.	2.	3.	4.	5.	7.	8.	10.	11.	13.
14.	16.	17.	18.	19.	20.	21.	22.	23.	25.
29.	35.	44.	54.	66.	79.	93.	108.	126.	150.
291.	537.	550.	505.	452.	406.	364.	320.	270.	216.
170.	165.	158.	150.	141.	132.	123.	114.	106.	99.
92.	86.	80.	74.	69.	65.	60.	56.	53.	49.

STOR

50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	51.	51.
51.	51.	51.	51.	51.	51.	51.	51.	51.	51.
51.	51.	51.	51.	51.	51.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	51.	51.
51.	51.	51.	51.	51.	52.	52.	53.	53.	54.
54.	54.	55.	55.	55.	56.	56.	56.	57.	57.
58.	60.	62.	65.	69.	72.	76.	81.	86.	92.
100.	104.	104.	103.	102.	102.	101.	100.	100.	99.
98.	97.	95.	92.	90.	87.	85.	82.	80.	78.
76.	74.	73.	71.	70.	68.	67.	66.	65.	64.

STAGE

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	550.	284.	97.	47.	7076.
CMS	16.	8.	3.	1.	200.
INCHES		7.33	10.04	10.16	10.16
MM		186.09	255.12	258.01	258.01
AC-FT		141.	193.	195.	195.
THOUS CU M		173.	238.	240.	240.

MAXIMUM STORAGE = 104.

Sheet 13 of 29

STATION 1, PLAN 1, RTIO 4

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	0.	0.	0.	0.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	3.	3.	4.	5.	6.	6.
7.	8.	[illegible]	9.	10.	10.	11.	11.	12.	13.
14.	17.	22.	27.	33.	40.	47.	54.	63.	75.
91.	108.	124.	136.	144.	142.	152.	153.	151.	147.
141.	133.	125.	117.	109.	100.	93.	85.	79.	73.
67.	62.	57.	53.	49.	45.	42.	39.	36.	33.

STOR

50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
50.	50.	50.	51.	51.	51.	51.	51.	52.	52.
52.	52.	52.	53.	53.	53.	53.	53.	53.	54.
54.	55.	56.	[illegible]	59.	61.	63.	65.	68.	71.
76.	[illegible]	65.	68.	91.	92.	93.	93.	93.	91.
90.	88.	85.	83.	81.	78.	76.	74.	72.	71.
69.	67.	66.	65.	64.	63.	62.	61.	60.	59.

STAGE

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	153.	125.	47.	23.	3448.
CMS	4.	4.	1.	1.	98.
INCHES		3.23	4.89	4.95	4.95
MM		82.15	124.30	125.74	125.74
AC-FT		62.	94.	95.	95.
THOUS CU M		77.	116.	117.	117.

Sheet 14 of 29

MAXIMUM STORAGE = 93.

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPLTATION

3 SUB-BASIN NO2 RUNOFF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.30	0.00	.66	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .600

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	2.00	.10	0.00	.06

UNIT HYDROGRAPH DATA

TP= 1.00 CP= .60 NTA= 0

RECESSION DATA

STRTQ= 0.00 QRCSN= -.05 RTIOR= 1.60

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.66 AND R= 2.67 INTERVALS

UNIT HYDROGRAPH 17 END-OF-PERIOD ORDINATES, LAG= 1.00 HOURS, CP= .61 VOL= 1.00

19.	65.	107.	113.	87.	60.	41.	28.	19.	13.
9.	6.	4.	3.	2.	1.	1.			

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.20	1	.00	.00	.00	0.	1.02	1.20	76	.04	.00	.04	1.
1.01	.40	2	.00	.00	.00	0.	1.02	1.40	77	.04	.00	.04	1.
1.01	1.00	3	.00	.00	.00	0.	1.02	2.00	78	.04	.00	.04	1.
1.01	1.20	4	.00	.00	.00	0.	1.02	2.20	79	.04	.00	.04	1.
1.01	1.40	5	.00	.00	.00	0.	1.02	2.40	80	.04	.00	.04	1.
1.01	2.00	6	.00	.00	.00	0.	1.02	3.00	81	.04	.00	.04	1.
1.01	2.20	7	.00	.00	.00	0.	1.02	3.20	82	.04	.00	.04	1.
1.01	2.40	8	.00	.00	.00	0.	1.02	3.40	83	.04	.00	.03	1.
1.01	3.00	9	.00	.00	.00	0.	1.02	4.00	84	.04	.01	.03	2.
1.01	3.20	10	.00	.00	.00	0.	1.02	4.20	85	.04	.01	.03	2.
1.01	3.40	11	.00	.00	.00	0.	1.02	4.40	86	.04	.01	.03	3.
1.01	4.00	12	.00	.00	.00	0.	1.02	5.00	87	.04	.01	.03	3.
1.01	4.20	13	.00	.00	.00	0.	1.02	5.20	88	.04	.01	.03	4.
1.01	4.40	14	.00	.00	.00	0.	1.02	5.40	89	.04	.01	.03	4.
1.01	5.00	15	.00	.00	.00	0.	1.02	6.00	90	.04	.01	.03	4.
1.01	5.20	16	.00	.00	.00	0.	1.02	6.20	91	.12	.09	.03	6.

1.01	5.40	17	.00	.00	.00	0.	1.02	6.40	92	.12	.09	.03	11.
1.01	6.00	18	.00	.00	.00	0.	1.02	7.00	93	.12	.09	.03	19.
1.01	6.20	19	.01	.00	.01	0.	1.02	7.20	94	.12	.09	.03	28.
1.01	6.40	20	.01	.00	.01	0.	1.02	7.40	95	.12	.09	.03	35.
1.01	7.00	21	.01	.00	.01	0.	1.02	8.00	96	.12	.09	.03	40.
1.01	7.20	22	.01	.00	.01	0.	1.02	8.20	97	.12	.09	.03	43.
1.01	7.40	23	.01	.00	.01	0.	1.02	8.40	98	.12	.09	.03	45.
1.01	8.00	24	.01	.00	.01	0.	1.02	9.00	99	.12	.09	.03	47.
1.01	8.20	25	.01	.00	.01	0.	1.02	9.20	100	.12	.09	.03	48.
1.01	8.40	26	.01	.00	.01	0.	1.02	9.40	101	.12	.09	.03	48.
1.01	9.00	27	.01	.00	.01	0.	1.02	10.00	102	.12	.09	.03	49.
1.01	9.20	28	.01	.00	.01	0.	1.02	10.20	103	.12	.09	.03	49.
1.01	9.40	29	.01	.00	.01	0.	1.02	10.40	104	.12	.09	.03	49.
1.01	10.00	30	.01	.00	.01	0.	1.02	11.00	105	.12	.09	.03	50.
1.01	10.20	31	.01	.00	.01	0.	1.02	11.20	106	.12	.09	.03	50.
1.01	10.40	32	.01	.00	.01	0.	1.02	11.40	107	.12	.09	.03	50.
1.01	11.00	33	.01	.00	.01	0.	1.02	12.00	108	.12	.09	.03	50.
1.01	11.20	34	.01	.00	.01	0.	1.02	12.20	109	.65	.62	.03	60.
1.01	11.40	35	.01	.00	.01	0.	1.02	12.40	110	.65	.62	.03	94.
1.01	12.00	36	.01	.00	.01	0.	1.02	13.00	111	.65	.62	.03	152.
1.01	12.20	37	.04	.00	.04	0.	1.02	13.20	112	.78	.75	.03	214.
1.01	12.40	38	.04	.00	.04	0.	1.02	13.40	113	.78	.75	.03	269.
1.01	13.00	39	.04	.00	.04	1.	1.02	14.00	114	.78	.75	.03	315.
1.01	13.20	40	.05	.00	.05	1.	1.02	14.20	115	.98	.95	.03	355.
1.01	13.40	41	.05	.00	.05	1.	1.02	14.40	116	.98	.95	.03	394.
1.01	14.00	42	.05	.00	.05	1.	1.02	15.00	117	.98	.95	.03	433.
1.01	14.20	43	.07	.00	.06	2.	1.02	15.20	118	1.71	1.68	.03	481.
1.01	14.40	44	.07	.00	.06	2.	1.02	15.40	119	4.68	4.65	.03	609.
1.01	15.00	45	.07	.00	.06	2.	1.02	16.00	120	1.04	1.01	.03	830.
1.01	15.20	46	.12	.01	.11	2.	1.02	16.20	121	.91	.88	.03	1006.
1.01	15.40	47	.32	.02	.30	3.	1.02	16.40	122	.91	.88	.03	1014.
1.01	16.00	48	.07	.00	.07	3.	1.02	17.00	123	.91	.88	.03	898.
1.01	16.20	49	.06	.00	.06	4.	1.02	17.20	124	.72	.68	.03	773.
1.01	16.40	50	.06	.00	.06	4.	1.02	17.40	125	.72	.68	.03	677.
1.01	17.00	51	.06	.00	.06	4.	1.02	18.00	126	.72	.68	.03	598.
1.01	17.20	52	.05	.00	.05	3.	1.02	18.20	127	.06	.03	.03	524.
1.01	17.40	53	.05	.00	.05	3.	1.02	18.40	128	.06	.03	.03	437.
1.01	18.00	54	.05	.00	.05	3.	1.02	19.00	129	.06	.03	.03	336.
1.01	18.20	55	.00	.00	.00	2.	1.02	19.20	130	.06	.03	.03	241.
1.01	18.40	56	.00	.00	.00	2.	1.02	19.40	131	.06	.03	.03	170.
1.01	19.00	57	.00	.00	.00	1.	1.02	20.00	132	.06	.03	.03	121.
1.01	19.20	58	.00	.00	.00	1.	1.02	20.20	133	.06	.03	.03	87.
1.01	19.40	59	.00	.00	.00	1.	1.02	20.40	134	.06	.03	.03	64.
1.01	20.00	60	.00	.00	.00	1.	1.02	21.00	135	.06	.03	.03	50.
1.01	20.20	61	.00	.00	.00	0.	1.02	21.20	136	.06	.03	.03	48.
1.01	20.40	62	.00	.00	.00	0.	1.02	21.40	137	.06	.03	.03	46.
1.01	21.00	63	.00	.00	.00	0.	1.02	22.00	138	.06	.03	.03	44.
1.01	21.20	64	.00	.00	.00	0.	1.02	22.20	139	.06	.03	.03	42.
1.01	21.40	65	.00	.00	.00	0.	1.02	22.40	140	.06	.03	.03	40.
1.01	22.00	66	.00	.00	.00	0.	1.02	23.00	141	.06	.03	.03	38.
1.01	22.20	67	.00	.00	.00	0.	1.02	23.20	142	.06	.03	.03	36.
1.01	22.40	68	.00	.00	.00	0.	1.02	23.40	143	.06	.03	.03	35.
1.01	23.00	69	.00	.00	.00	0.	1.03	0.00	144	.06	.03	.03	33.
1.01	23.20	70	.00	.00	.00	0.	1.03	.20	145	0.00	0.00	0.00	31.
1.01	23.40	71	.00	.00	.00	0.	1.03	.40	146	0.00	0.00	0.00	30.
1.02	0.00	72	.00	.00	.00	0.	1.03	1.00	147	0.00	0.00	0.00	29.
1.02	.20	73	.04	.00	.04	0.	1.03	1.20	148	0.00	0.00	0.00	27.
1.02	.40	74	.04	.00	.04	0.	1.03	1.40	149	0.00	0.00	0.00	26.
1.02	1.00	75	.04	.00	.04	1.	1.03	2.00	150	0.00	0.00	0.00	25.

SUM 24.99 21.19 3.80 12527.
(635.)(538.)(97.)(354.73)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1014.	566.	173.	83.	12523.
CMS	29.	16.	5.	2.	355.
INCHES		17.54	21.47	21.57	21.57
MM		445.45	545.41	547.95	547.95
AC-FT		280.	343.	345.	345.
THOUS CU M		346.	424.	426.	426.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	2.	2.	2.	2.	3.	3.	4.	4.
4.	3.	3.	3.	2.	2.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	3.	3.	4.	4.	4.
6.	11.	19.	28.	35.	40.	43.	45.	47.	48.
48.	49.	49.	49.	50.	50.	50.	50.	60.	94.
152.	214.	269.	315.	355.	394.	433.	481.	609.	830.
1306.	1014.	898.	773.	677.	598.	524.	437.	336.	261.
170.	121.	87.	64.	50.	48.	46.	44.	42.	40.
38.	36.	35.	33.	31.	30.	29.	27.	26.	25.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1014.	566.	173.	83.	12523.
CMS	29.	16.	5.	2.	355.
INCHES		17.54	21.47	21.57	21.57
MM		445.45	545.41	547.95	547.95
AC-FT		280.	343.	345.	345.
THOUS CU M		346.	424.	426.	426.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	2.	2.	3.	3.	3.
3.	2.	2.	2.	2.	1.	1.	1.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	2.	3.	3.	3.
4.	8.	14.	21.	26.	30.	32.	34.	35.	36.
36.	37.	37.	37.	37.	37.	37.	37.	45.	71.
114.	161.	202.	236.	267.	296.	325.	361.	457.	622.
754.	761.	673.	580.	508.	449.	393.	328.	252.	181.
127.	90.	65.	48.	38.	36.	34.	33.	31.	30.
26.	27.	26.	25.	24.	22.	21.	20.	20.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	761.	424.	130.	63.	9392.
CMS	22.	12.	4.	2.	266.

Sheet 17 of 29

INCHES	13.15	16.10	16.18	16.18
MM	334.08	409.06	410.96	410.96
AC-FT	210.	256.	259.	259.
THOUS CU M	259.	318.	319.	319.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	2.	2.	2.
3.	5.	10.	14.	18.	20.	21.	23.	23.	24.
24.	24.	25.	25.	25.	25.	25.	25.	30.	47.
76.	107.	135.	158.	178.	197.	217.	241.	305.	415.
503.	507.	449.	387.	338.	299.	262.	219.	168.	121.
85.	60.	43.	32.	25.	24.	23.	22.	21.	20.
19.	18.	17.	16.	16.	15.	14.	14.	13.	12.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	507.	283.	87.	42.	6261.
CMS	14.	8.	2.	1.	177.
INCHES		8.77	10.74	10.79	10.79
MM		222.72	272.71	273.97	273.97
AC-FT		140.	172.	172.	172.
THOUS CU M		173.	212.	213.	213.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	3.	5.	7.	9.	10.	11.	11.	12.	12.
12.	12.	12.	12.	12.	12.	12.	12.	15.	24.
38.	54.	67.	79.	89.	99.	108.	120.	152.	207.
251.	254.	224.	196.	169.	150.	131.	109.	84.	60.
42.	30.	22.	16.	13.	12.	11.	11.	10.	10.
9.	8.	9.	8.	8.	7.	7.	7.	7.	6.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	254.	141.	43.	21.	3131.
CMS	7.	4.	1.	1.	89.
INCHES		4.32	5.37	5.39	5.39
MM		111.36	136.35	136.99	136.99
AC-FT		70.	86.	86.	86.
THOUS CU M		86.	106.	106.	106.

COMBINE HYDROGRAPHS

4 COMPINE 2 HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	2	0	0	0	0	1	0	0

SUM OF 2 HYDROGRAPHS AT 1 PLAN 1 RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	3.	3.	4.	4.	4.	5.	7.	8.	9.
9.	9.	9.	9.	9.	8.	8.	7.	7.	6.
6.	5.	5.	5.	4.	4.	4.	3.	3.	3.
3.	2.	2.	2.	2.	3.	3.	3.	3.	3.
4.	4.	4.	4.	5.	6.	6.	7.	8.	8.
10.	16.	25.	36.	45.	53.	59.	65.	69.	74.
77.	80.	83.	86.	88.	91.	93.	94.	106.	144.
209.	284.	357.	423.	487.	553.	766.	980.	1204.	1592.
1971.	2114.	1909.	1784.	1581.	1410.	1253.	1078.	877.	673.
500.	371.	277.	232.	213.	203.	193.	183.	173.	163.
155.	146.	139.	131.	125.	118.	112.	106.	101.	96.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2114.	1179.	371.	180.	26961.
CMS	60.	33.	11.	5.	763.
INCHES		16.62	20.94	21.11	21.11
MM		422.04	531.92	536.22	536.22
AC-FT		585.	737.	743.	743.
THOUS CU M		721.	909.	916.	916.

SUM OF 2 HYDROGRAPHS AT 1 PLAN 1 RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
2.	2.	2.	3.	3.	3.	4.	5.	6.	7.
7.	7.	7.	7.	6.	6.	6.	5.	5.	5.
4.	4.	4.	3.	3.	3.	3.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	3.
3.	3.	3.	3.	4.	4.	5.	5.	6.	6.
8.	12.	19.	27.	34.	40.	45.	49.	52.	55.
58.	60.	63.	65.	66.	68.	69.	71.	80.	108.
157.	213.	267.	318.	366.	414.	465.	523.	820.	1188.
1478.	1585.	1499.	1338.	1186.	1058.	940.	809.	657.	504.
375.	278.	233.	210.	199.	189.	172.	161.	152.	143.
134.	126.	119.	112.	106.	100.	94.	89.	84.	79.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1585.	861.	278.	134.	20143.

CMS	45.	24.	8.	4.	570.	
INCHES		12.14	15.65	15.77	15.77	
MM		308.35	397.40	400.63	400.63	
AC-FT		427.	550.	555.	555.	
THOUS CU M		527.	679.	684.	684.	

SUM OF 2 HYDROGRAPHS AT 1 PLAN 1 RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	3.	3.	4.	4.
5.	4.	4.	4.	4.	4.	4.	4.	3.	3.
3.	3.	2.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
2.	2.	2.	2.	2.	3.	3.	4.	4.	4.
5.	8.	13.	18.	23.	27.	30.	32.	35.	37.
39.	40.	42.	43.	44.	45.	46.	47.	53.	72.
105.	142.	178.	212.	244.	276.	310.	349.	431.	565.
794.	1044.	999.	892.	791.	705.	626.	539.	438.	336.
254.	225.	202.	182.	167.	156.	146.	136.	127.	119.
111.	104.	97.	91.	85.	80.	75.	70.	66.	62.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1044.	545.	184.	89.	13338.
CMS	30.	15.	5.	3.	378.
INCHES		7.68	10.36	10.44	10.44
MM		195.14	263.12	265.27	265.27
AC-FT		270.	364.	367.	367.
THOUS CU M		333.	450.	453.	453.

SUM OF 2 HYDROGRAPHS AT 1 PLAN 1 RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	2.	2.	2.
3.	4.	6.	9.	11.	13.	15.	16.	17.	18.
19.	20.	21.	22.	22.	23.	23.	24.	27.	36.
52.	71.	89.	106.	122.	138.	155.	174.	215.	283.
342.	362.	348.	329.	313.	299.	283.	262.	235.	207.
183.	163.	147.	133.	121.	112.	104.	96.	89.	83.
77.	71.	66.	61.	57.	53.	49.	46.	43.	40.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	362.	247.	91.	44.	6579.
CMS	10.	7.	3.	1.	186.
INCHES		3.47	5.11	5.15	5.15
MM		88.26	129.78	130.85	130.85
AC-FT		122.	180.	181.	181.

THOUS CU M 151. 222. 224. 224.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

5 ROUTE THROUGH RESERVOIR NO 2

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	77.	-1

STAGE	242.00	244.00	246.00	250.00	255.00
FLOW	0.00	120.00	340.00	970.00	2010.00
CAPACITY=	77.	105.	134.	314.	
ELEVATION=	242.	243.	244.	250.	

CREL	SPWID	COQW	EXPW	ELEVL	COOL	CAREA	EXPL
242.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
246.0	3.1	1.5	550.

STATION 2, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	3.
3.	3.	4.	4.	4.	4.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	5.
5.	5.	6.	8.	9.	12.	14.	17.	20.	23.
26.	29.	32.	35.	38.	41.	44.	47.	50.	54.
61.	71.	85.	102.	123.	161.	209.	273.	396.	1253.
1860.	2063.	2056.	1877.	1669.	1488.	1328.	1167.	985.	793.
618.	479.	380.	337.	326.	311.	303.	292.	281.	270.
2[illegible]	249.	239.	229.	219.	210.	201.	192.	183.	175.

STORAGE

77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.

77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	78.	78.	78.	78.	78.	78.	78.
78.	79.	79.	79.	79.	79.	79.	79.	79.	79.
79.	79.	79.	79.	79.	79.	79.	79.	79.	79.
79.	79.	79.	79.	79.	79.	79.	79.	79.	79.
79.	79.	79.	79.	79.	79.	79.	79.	79.	79.
79.	79.	80.	81.	81.	82.	84.	85.	86.	88.
89.	91.	92.	93.	95.	96.	97.	99.	100.	102.
106.	110.	117.	125.	135.	145.	158.	176.	197.	212.
219.	222.	222.	220.	218.	216.	213.	211.	208.	205.
202.	199.	196.	193.	190.	187.	184.	181.	178.	175.
172.	169.	166.	164.	161.	158.	156.	154.	151.	149.

STAGE

242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.2	242.2	242.2	242.3	242.3	242.4
242.4	242.5	242.5	242.6	242.6	242.7	242.7	242.8	242.8	242.9
243.0	243.2	243.4	243.7	244.0	244.4	244.8	245.4	246.1	246.6
246.8	246.9	246.9	246.9	246.8	246.7	246.6	246.6	246.5	246.4
246.3	246.2	246.1	246.0	245.9	245.8	245.7	245.6	245.5	245.4
245.3	245.2	245.1	245.0	244.9	244.8	244.7	244.7	244.6	244.5

PEAK OUTFLOW IS 2063. AT TIME 40.67 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2063.	1073.	336.	162.	24345.
CMS	58.	30.	10.	5.	689.
INCHES		15.12	18.94	19.06	19.06
MM		384.02	481.20	484.20	484.20
AC-FT		532.	667.	671.	671.
THOUS CU M		656.	822.	827.	827.

STATION 2, PLAN 1, RATIO 2

END-OF-PERIOD HYDSOGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	2.	3.	3.	3.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
4.	4.	5.	6.	7.	9.	11.	13.	15.	17.
19.	22.	24.	26.	23.	31.	33.	35.	37.	41.

Sheet 22 of 29

46.	54.	64.	77.	92.	108.	131.	166.	215.	291.
700.	1494.	1544.	1415.	1260.	1124.	1004.	883.	749.	608.
480.	382.	337.	326.	314.	302.	290.	278.	266.	255.
244.	233.	222.	212.	202.	192.	183.	174.	166.	158.

STORAGE

77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	78.	78.	78.	78.	78.
78.	78.	78.	78.	78.	79.	79.	79.	79.	79.
79.	79.	79.	79.	79.	79.	79.	79.	79.	79.
79.	79.	79.	78.	78.	78.	78.	78.	78.	78.
78.	78.	78.	78.	78.	78.	78.	78.	79.	79.
79.	79.	79.	80.	80.	81.	82.	83.	84.	85.
86.	87.	88.	89.	90.	91.	92.	93.	94.	96.
98.	102.	107.	113.	120.	128.	137.	147.	160.	181.
204.	216.	216.	215.	212.	211.	209.	207.	205.	202.
199.	196.	193.	190.	187.	184.	180.	177.	174.	171.
168.	165.	162.	159.	156.	154.	151.	149.	147.	144.

STAGE

242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.1	242.1	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.1	242.1	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.1	242.1	242.2	242.2	242.2	242.3
242.3	242.4	242.4	242.4	242.5	242.5	242.5	242.6	242.6	242.7
242.8	242.9	243.1	243.3	243.5	243.8	244.1	244.4	244.9	245.6
246.3	246.7	246.7	246.7	246.6	246.6	246.5	246.4	246.4	246.3
246.2	246.1	246.0	245.9	245.8	245.7	245.5	245.4	245.3	245.2
245.1	245.0	244.9	244.8	244.7	244.7	244.6	244.5	244.4	244.3

PEAK OUTFLOW IS 1544. AT TIME 41.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1544.	750.	244.	118.	17699.
CMS	44.	21.	7.	3.	501.
INCHES		10.57	13.77	13.86	13.86
MM		268.45	349.76	352.01	352.01
AC-FT		372.	484.	488.	488.
THOUS CU M		459.	598.	601.	601.

STATION 2, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Sheet 23 of 29

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	2.	2.	2.	2.	2.	3.
3.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	3.	3.	4.	5.	6.	7.	9.	10.	11.
13.	14.	16.	18.	19.	20.	22.	23.	25.	27.
31.	36.	43.	52.	62.	73.	85.	98.	115.	148.
199.	268.	341.	768.	833.	758.	679.	600.	514.	426.
353.	333.	321.	309.	296.	283.	270.	258.	246.	234.
223.	212.	201.	191.	181.	171.	162.	154.	145.	137.

STORAGE

77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	78.	78.
78.	78.	78.	78.	78.	78.	78.	78.	78.	78.
78.	78.	78.	78.	78.	78.	78.	76.	76.	76.
78.	78.	78.	78.	78.	78.	78.	78.	76.	78.
78.	78.	78.	78.	78.	78.	78.	78.	78.	78.
78.	78.	78.	79.	79.	80.	80.	81.	82.	82.
83.	84.	84.	85.	86.	87.	87.	88.	89.	90.
91.	94.	97.	101.	106.	111.	117.	124.	131.	142.
155.	174.	194.	205.	206.	205.	203.	202.	200.	197.
195.	192.	189.	186.	182.	178.	175.	172.	168.	165.
162.	159.	156.	153.	151.	148.	145.	143.	141.	139.

STAGE

242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.1	242.1	242.1	242.1	242.1	242.1	242.2	242.2
242.2	242.2	242.3	242.3	242.3	242.3	242.4	242.4	242.4	242.5
242.5	242.6	242.7	242.9	243.0	243.2	243.4	243.6	243.9	244.3
244.7	245.3	246.0	246.4	246.4	246.4	246.3	246.3	246.2	246.1
246.0	245.9	245.8	245.7	245.6	245.5	245.4	245.3	245.1	245.0
244.9	244.8	244.7	244.6	244.6	244.5	244.4	244.3	244.2	244.2

Sheet 24 of 29

PEAK OUTFLOW IS 833. AT TIME 41.67 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	833.	436.	153.	74.	11096.
CMS	24.	12.	4.	2.	314.
INCHES		6.14	8.63	8.69	8.69
MM		155.94	219.19	220.69	220.69
AC-FT		216.	304.	306.	306.
THOUS CU M		266.	374.	377.	377.

STATION 2, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	3.	4.	4.	5.	6.
6.	7.	8.	9.	9.	10.	11.	12.	12.	14.
15.	18.	22.	26.	31.	37.	43.	50.	58.	69.
82.	97.	112.	127.	146.	161.	174.	183.	190.	193.
193.	191.	187.	183.	178.	172.	166.	159.	153.	146.
140.	134.	127.	121.	117.	114.	110.	107.	103.	100.

STORAGE

77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	78.	78.	78.	78.	78.
78.	78.	78.	78.	78.	78.	78.	78.	78.	78.
78.	78.	78.	77.	77.	77.	77.	77.	77.	77.
77.	77.	77.	77.	77.	77.	77.	77.	78.	78.
78.	78.	78.	78.	78.	78.	79.	79.	79.	80.
80.	80.	81.	81.	81.	82.	82.	82.	83.	83.
84.	85.	87.	89.	91.	94.	97.	100.	104.	109.
116.	123.	130.	136.	141.	145.	149.	151.	153.	154.
154.	153.	152.	151.	150.	148.	146.	145.	143.	141.
139.	138.	136.	134.	133.	131.	129.	128.	126.	124.

STAGE

242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0	242.0
242.0	242.0	242.0	242.0	242.0	242.0	242.1	242.1	242.1	242.1
242.1	242.1	242.1	242.1	242.2	242.2	242.2	242.2	242.2	242.2
242.3	242.3	242.4	242.4	242.5	242.6	242.7	242.8	243.0	243.1
243.4	243.6	243.9	244.1	244.2	244.4	244.5	244.6	244.6	244.7
244.7	244.6	244.6	244.6	244.5	244.5	244.4	244.4	244.3	244.2
244.2	244.1	244.1	244.0	244.0	243.9	243.8	243.8	243.7	243.7

PEAK OUTFLOW IS 193. AT TIME 43.67 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	193.	169.	67.	32.	4665.

Sheet 26 of 29

CMS	5.	5.	2.	1.	138.
INCHES		2.38	3.78	3.81	3.81
MM		60.55	95.97	96.72	96.72
AC-FT		84.	133.	134.	134.
THOUS CU M		103.	164.	165.	165.

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 .75	RATIO 3 .50	RATIO 4 .25
HYDROGRAPH AT	1	.36	1	1140.	855.	570.	285.
	(	.93)	(	32.29)(	24.21)(	16.14)(	8.07)(
ROUTED TO	1	.36	1	1101.	826.	550.	153.
	(	.93)	(	31.19)(	23.39)(	15.57)(	4.33)(
HYDROGRAPH AT	1	.30	1	1014.	761.	507.	254.
	(	.78)	(	28.72)(	21.54)(	14.36)(	7.18)(
2 COMBINED	1	.66	1	2114.	1585.	1044.	362.
	(	1.71)	(	59.86)(	44.89)(	29.56)(	10.25)(
ROUTED TO	2	.66	1	2063.	1544.	833.	193.
	(	1.71)	(	58.42)(	43.72)(	23.59)(	5.46)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	242.00	242.00	246.00
STORAGE	77.	77.	194.
OUTFLOW	0.	0.	340.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	246.95	.95	222.	2063.	5.00	40.67	0.00
.75	246.74	.74	216.	1544.	4.00	41.00	0.00
.50	246.40	.40	206.	933.	3.00	41.67	0.00
.25	244.66	0.00	154.	193.	0.00	43.67	0.00

REFERENCES

APPENDIX E

REFERENCES

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"Flood Hydrograph Package (HEC-1) users Manual for Dam Safety Investigations", U.S. Army Corps of Engineers, Hydrologic Engineering Center, September 1979.

"Lower Hudson River Basin Hydrologic Flood Routing Model", for New York District Corps of Engineers, Water Resources Engineers, Inc., January 1977.

"Standard Project Flood Determination", EM-1110-2-1411, Army Corps of Engineers, Washington, D.C. Rev. 1965.

"Probable Maximum Precipitation Estimates, United States East of the 105th Meridian", Hydrometeorological Report No. 51, National Weather Service, June 1978.

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"Water Resources Data for New York, Vol.1", U.S. Geological Survey Water Data Report NY-79-1, 1979.

"Geologic Map of New York, Lower Hudson Sheet", The University of the State of New York, The State Education Department State Museum and Science Service Geological Survey, 1961.

"Geology of New York City and Environments", The Nature History Press, N.Y., Schubert, Chrisopher, Jr., 1968.

OTHER DATA

APPENDIX F

DAM INSPECTION REPORT

NB	CTY	YR AP.	DAM NO.	INS. DATE	USE	TYPE
11	60	07	0002741	04/06/72	02	1

AS BUILT INFORMATION

- [1] Location of Sp'way and outlet
- [ ] Elevations
- [1] Size of Sp'way and Outlet
- [ ] Geometry of Non-overflow section

GENERAL CONDITION OF NON-OVERFLOW SECTION

[1]

- [2] Settlement
- [2] Cracks
- [1] Deflections
- [2] Joints
- [2] Surface of Concrete
- [1] Leakage
- [1] Undermining
- [1] Settlement of Embankment
- [2] Crest of Dam
- [2] Downstream Slope
- [2] Upstream Slope
- [2] Toe of Slope

GENERAL COND. OF SP'WAY AND OUTLET WORKS

[1]

- [2] Auxiliary Spillway
- [2] Service or Concrete Sp'way
- [1] Stilling Basin
- [2] Joints
- [2] Surface of Concrete
- [1] Spillway Toe
- [2] Mechanical Equipment
- [1] Plunge Pool
- [2] Drain

- [1] Maintenance
- [3] Evaluation
- [1] Hazard Class
- [V] Inspector

COMMENTS:

3 FEET OF INCLEAN FLASH BOARDS IN PLACE

Form IWSI. 6-18-16 5000 (16-1526)

(NOTICE: After filling out one of these forms as completely as possible for each dam in your district, return it at once to the Conservation Commission, Albany.)

STATE OF NEW YORK

CONSERVATION COMMISSION

ALBANY

DAM REPORT

....., 191
(Date)

CONSERVATION COMMISSION,

DIVISION OF INLAND WATERS.

GENTLEMEN:

I have the honor to make the following report in relation to the structure known as the New White Plains Reservoir Dam.

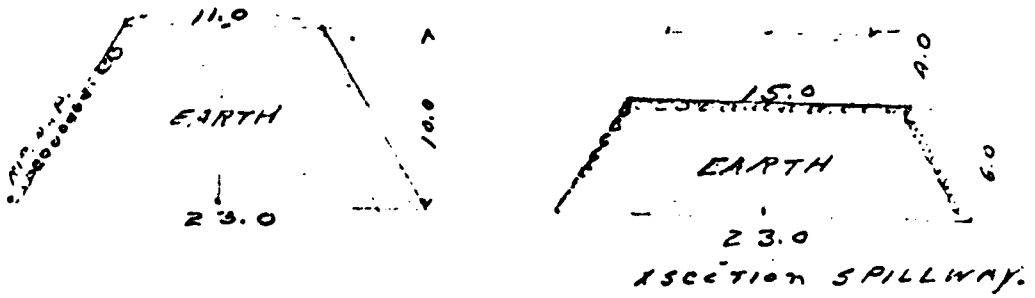
This dam is situated ~~in~~ directly below the Old Reservoir in the Town of Northcastle Westchester County, about 1 3/4 miles (State distance) from the Village ~~or City~~ of White Plains. The distance Down (Up or down) stream from the dam, to the Harlem River (Name of river or other body of water) is about 1 1/4 miles (State distance).

The dam is now owned by Village of White Plains (Town, village or private owner) and was built in or about the year 1907, and was extensively repaired or reconstructed during the year ——.

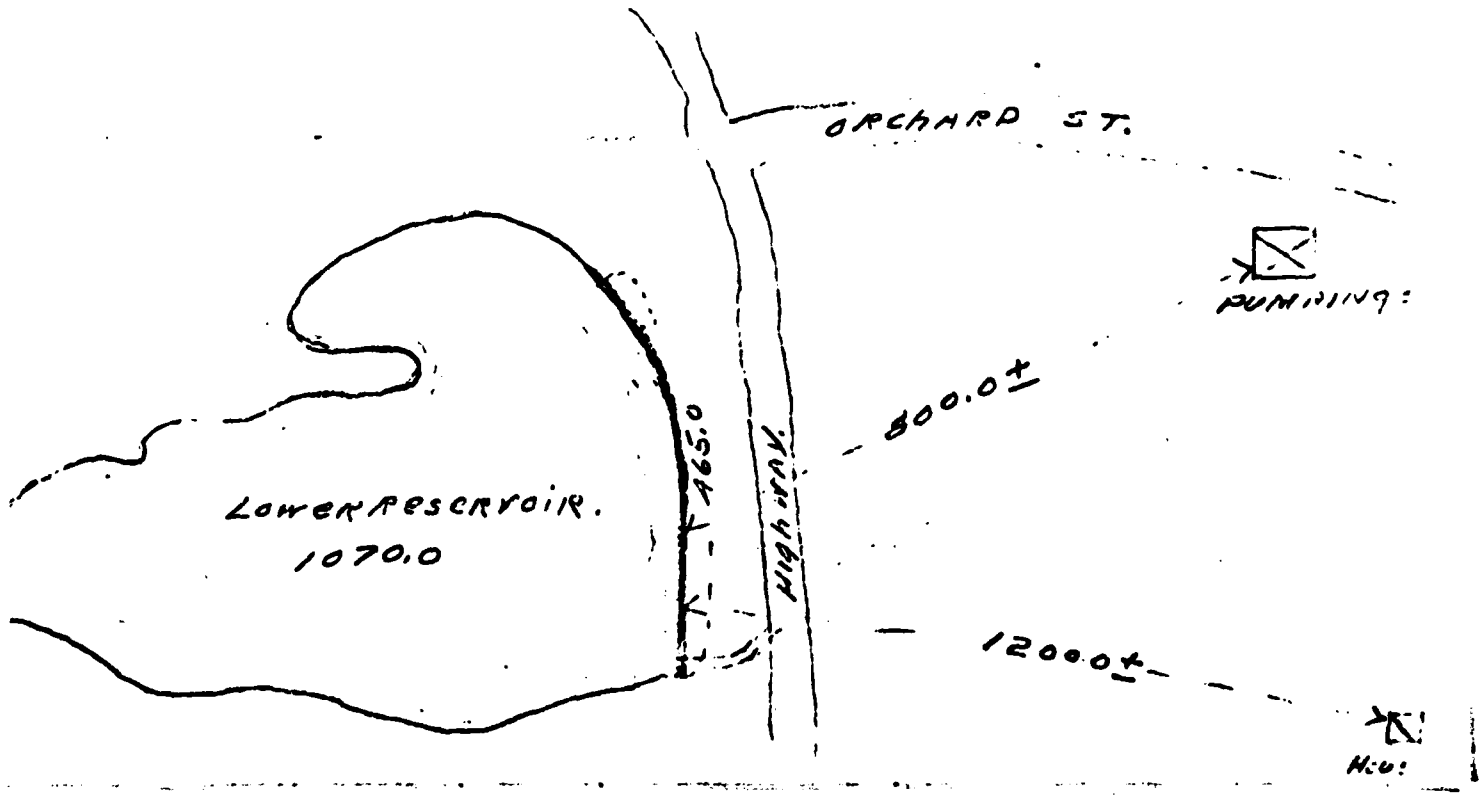
As it now stands, the spillway portion of this dam is built of Concrete (Stone, concrete, timber, etc.) and the other portions are built of Rip rap faced with stone (Stone, earth, timber, etc.).

As nearly as I can learn, the character of the foundation bed under the spillway portion of the dam is Rock and under the remaining portions such foundation bed is Rock.

(In the space below, make one sketch showing the form and dimensions of a cross section through the spillway or waste-weir of this dam, and a second sketch showing the same information for a cross section through the other portion of the dam. Show particularly the greatest height of the dam above the stream bed, its thickness at the top, and thickness at the bottom, as nearly as you can learn.)



(In the space below, make a third sketch showing the general plan of the dam, and its approximate position in relation to buildings or other conspicuous objects in the vicinity.



The total length of this dam is 465 feet. The spillway or waste-weir portion, is about 12 feet long, and the crest of the spillway is about 4 feet below the top of the dam.

The number, size and location of discharge pipes, waste pipes or gates which may be used for drawing off the water from behind the dam, are as follows: One 12 inch pipe used to pump to stand pipe

State briefly, in the space below, whether, in your judgment, this dam is in good condition, or bad condition, describing particularly any leaks or cracks which you may have observed.)

This dam is practicaly a new dam and is undoubtedly well built

Reported by Bill Bailey
(Signature)

R F D Route 1
(Address—Street and number, P. O. Box or R. F. D. route)

White Plains
(Name of place)

(SEE OTHER SIDE)

8-22-24-3000 (6-1206)

STATE OF NEW YORK

DEPARTMENT OF

State Engineer and Surveyor

ALBANY

Report of a Structure Impounding Water

To assist in carrying out the provisions of Section 22 of the Conservation Law, being Chapter LXV of the Consolidated Laws of New York State, relating to safeguarding life and property and the erection, reconstruction, or maintenance of structures for impounding water, owners of such structures are requested to fill out as completely as possible this report form for each such dam or reservoir owned within the State of New York for which no plans or reports relative thereto are on file in this Department, and to return this report form, together with prints or photographs explanatory thereof to this department. Reservoir #2

1. The structure is on Tompkins Brook flowing into Bronx River in the Town of White Plains County of Westchester and State of N.Y.

See map attached

(Give exact distance and direction from a well-known bridge, dam, village main cross-road or mouth of a stream)

2. Is any part of the structure built upon or does its pond flood any State lands? No

3. The name and address of the owner is City of White Plains

4. The structure is used for Water Supply City of White Plains

5. The material of the right bank, in the direction with the current, is ; at the spillway crest elevation this material has a top slope of inches vertical to a foot horizontal on the center line of the structure, a vertical thickness at this elevation of feet, and the top surface extends for a vertical height of feet above the spillway crest.

6. The material of the left bank is ; has a top slope of inches to a foot horizontal, a thickness of feet and a height of feet.

7. The natural material of the bed on which the structure rests is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.)

8. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc.

9. If the bed is in layers, are the layers horizontal or inclined?..... If inclined what is the direction of the horizontal outcropping relative to the axis of the main structure and the inclination and direction of the layers in a plane perpendicular to the horizontal outcropping?.....

10. What is the thickness of the layers?.....

11. Are there any porous seams or fissures?.....

12. The watershed at the above structure and draining into the pond formed thereby is 400 acres ~~square miles~~.

13. The pond area at the spillway crest elevation is.....acres and the pond impounds 16,000,000 cubic feet of water.

14. The maximum known flow of the stream at the structure was.....cubic feet per second on

.....
(Date)

15. Has the spillway capacity ever been exceeded by a high flow? N.O.....

Can any possible flood flow from the pond otherwise than through the wastes noted under 17 and 18 of this report? N.O..... If so, give the location, the length and the elevation relative to the spillway crest and the character and slopes of the ground of such possible wastes.....

16. State if any damage to life or to any buildings, roads or other property could be caused by any possible failure of the above structure. Describe the location, the character and the use of buildings below the structure which might be damaged by any failure of the structure; of roads adjacent to or crossing the stream below the structure, giving the lowest elevation of the roadway above the stream bed and giving the shape, the height and the width of stream openings; and of any embankments or steep slopes that any flood could pass over. Also indicate the character and use made of the ground below the structure.

The area below the dam is used for deep wells and pumping Station

17. WASTES. The spillway of the above structure is.....feet long in the clear; the waters are held at the right end by a..... the top of which is.....feet above the spillway crest, and has a top width of.....feet; and at the left end by a....., the top of which is.....feet above the spillway crest, and has a top width of.....feet.

18. There is also for flood discharge a pipe.....inches inside diameter and the bottom is..... feet below the spillway crest; and a (sluice, gate outlet).....feet wide in the clear by..... feet high, and the bottom is.....feet below the spillway crest.

19. APRON. Below the spillway there is an apron built of ..... (Material) ....., ... feet wide and ..... feet thick. The downstream side of the apron has a thickness of ..... feet for a width of ..... feet.

20. Has the structure any weaknesses which are liable to cause its failure in high flows? .....

.....

21. SKETCHES. On the back of this report make a sketch to scale for each different cross-section of the above structure at the greatest depth; giving the height and the depth from the surface of the foundation, the bottom width, the top width (for a concrete or masonry spillway at two feet below the crest), the elevation of the top in reference to the spillway crest, the length of the section, and the material of which the section is constructed; on the spillway section show a cross section of the apron, giving its width, thickness and material, and show the abutment or wash wall at the end of the spillway, giving its heights and thickness. Mark each section with a capital letter. Also sketch a plan; show the above sections by their top lines, giving the mark and the length of each; the openings by their horizontal dimensions; the abutments by their top width and top lengths from the upstream face of the spillway section; and outline the apron. Also sketch an elevation of each end of the structure with a cross section of the banks, giving the depth and width excavated into the banks.

22. WATER SUPPLY. The waters impounded by the above structure have (~~not~~) been used for a public water supply since 1907 by City of White Plains

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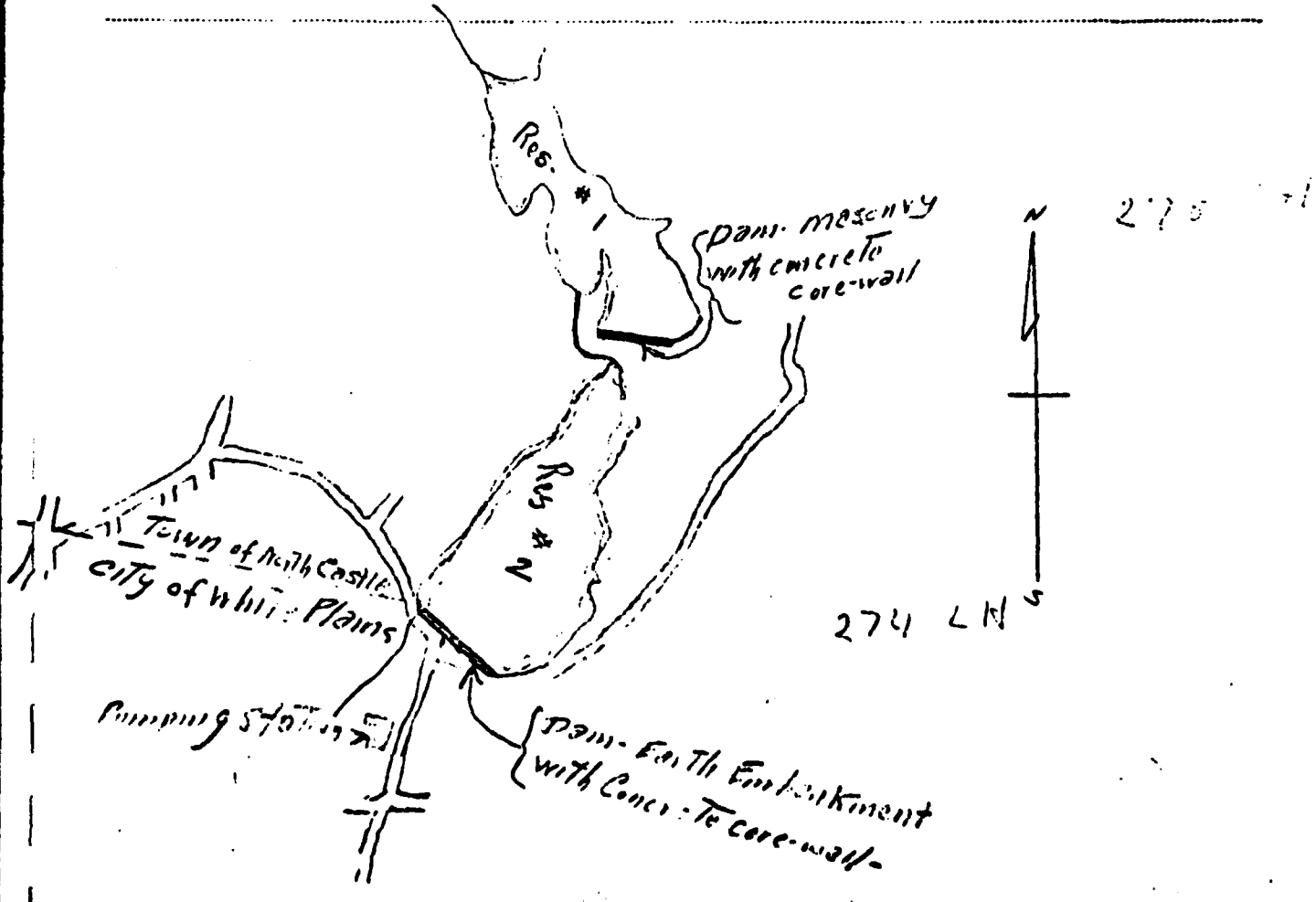

The above information is correct to the best of my knowledge and belief.

185 main Street
(Address of signer)
White Plains N.Y.
Feb 27, 1925
(Date)

Wm J. Collier
(Signature)
Chief Engr Supt.
(A person signing for owner should indicate his title or authority)


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